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COMPARATIVE SIOUAN II[1]

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2. Proto-Siouan consonants and their development

2.0. In this and all following chapters we speak of Proto-Siouan as though it were an existing language and analyze its phonemic structure with this approach in mind.

2.1. The Proto-Siouan consonant phonemes are: stops *p, *t, *k^y, *k, *q; fricatives *s, *x, *h; nasals *m, *n; and loose contact continuants *w, *L, *L^y.

2.1.1. Stops *p, *t, *k are voiceless and aspirated, usually fortes. These phonemes represent the most stable elements in Siouan phonology.

*k^y is a voiceless palatal stop, phonetically perhaps t^y or č, depending on the dialect.

*q occurs in two allophones, a glottal stop ʔ and a back velar fricative x̣, but the latter is rather rare. Moreover, the distribution of *q is quite restricted and will be discussed under *q-reflexes below, also under clusters in chapter **5** below.

2.1.2. *s occurs in two isoglosses, /s/ and /c/, the latter attested by reflex /c/ in Hidatsa and Crow. Other dialects have /s/.

Reconstructed *x already had two allophones in Proto-Siouan; a velar voiceless fricative x̣ occurred before low vowels, and a palatal voiceless fricative x occurred only before high vowels (i, u).

The phonetic value of *h is the normal voiceless aspirate h, usually retained in all daughter languages.

2.1.3. Due to considerable overlapping of allophones, reconstructed *m, *n, *w, *L, and L^y represent areas of great instability in Siouan phonology. Allophone b of *m thus overlapped with allophone β of *w in several dialects; similarly, allophone d of *n and allophone ð of the liquid *L. Such allophonic variations still occur in many of the daughter languages, and alternations of this type are present in the morphophonemic processes of these languages.

Reconstructed *L^y is a palatal liquid, usually voiced, occurring in two main allophones ry or ly and ny, the latter before nasal vowels. When preceded and/or followed by high vowels (i, u), *L^y is sometimes "depalatalized" in some dialects, falling together with *L, a non-palatal liquid whose normal allophones were r and l. Furthermore, it is quite possible that *L^y developed into /y/ in several Proto-Siouan dialects.

2.2.0. In treating the reflexes of Proto-Siouan phonemes a short summary of the development of the reconstructed phoneme will precede the list of cognates. In listing these, the reconstructed Proto-Siouan form will be given first, followed by its postulated meaning, followed in turn by cognates in the daughter languages. The meaning of these cognates will be the same as that of the reconstructed form, unless otherwise indicated.

2.2.1. Initial *p- remained in all morphemes carrying the main stress.

*péti *fire*: Bl. péti ~ petí Of. apéti Tu. pé·ti ~ pe·č Os. péce OmP. pede K. pyeže Q. pete D. péta W. pé·č Č. péje; cp. also Ca. ɬ·pi·ʔ *fire*.

[1] For Comparative Siouan I, see IJAL 16.61–66 (1950).

*pá *head*: Bl.Os.OmP.D.Č. pa W. pa *nose* M. paʔah H. apá *his nose* C. apé *his nose*.

*pí *liver*: Bl.D. pi Os. cepí M. piʔih W. pí·ra H. apišá C. apté (syncope?).

*pás- *sharp point*: Bl. psųtí *sharp* Of. pafúnti Os. paθí D. pe, pésto *sharp, pointed* M. pásihoʔoš *sharp* Č. páhį *sharp* H. apcáhkeʔec *he sharpens*.

*pétą *crane*: Os. pétǫ OmP. petą D. pehá W. pečą- H. ápica.

*pí *good*: Bl.Os.D.Č. pi Tu. pi· W. pį.

*pús~*pux- *sand*: Bl. pxakí Os. piθá W. pų·záke H. púxuki, pu·xagá D. pusá *dry*.

*pó ~ *pú *to swell*: Bl. po Of. popúti D. póγą M. pá·hoʔoš H. púac; cp. also Bl. tupó *to burst*.

*púxi *foam*: Bl. aní pupúxi *water foam* M. minipúxte *water foam* H. puxí; cp. also cognates for *sand* and *to swell*, above.

2.2.2. In morphemes which lost their stress in Proto-Siouan times *p- remained in Mandan and in the Ohio Valley group, as well as in most cognates available from the Crow-Hidatsa group. Reflexes in the remaining daughter languages show that *p- underwent any or all stages of the following development: p − b −{m w}. Beyond this general pattern, nothing more definite can be said at this point, because of the paucity of material. Reflexes of specific reconstructed morphemes are given in the following paragraph.

*pa- *by pushing*: Bl.Of.D.M.H.C. pa- Tu. pahe· *to pound* Os.OmP. ba- Č.W. wa-.

*pa- *by cutting, sawing*: M. pa- H.C. pa- Of. ófpaki *to cut* Os.K.Č.Ds. ba- OmP. ma- W. mą- Dt. wa-; this is probably the same morpheme originally as above, but with a specialized meaning.

*pu- *by blowing, shooting*: Bl. puhe *to blow* M. pųxahoʔoš *he blew it* Os. pu- W. po- K. bu- OmP. bi- *blowing*, mu- *shooting* Ds.Č. bo- Dt. wo- H. wu- ~ u- C. o·-; cp. also Ca. pu· *to blow*

2.2.2.1. The apparent inconsistency of development noted under **2.2.2.** may be explained by the fact that all the cognates cited belong in a class of morphemes known as instrumental prefixes; such prefixes are found more or less productively in all Siouan languages[2]. It appears to be true that many instrumental prefixes are of onomatopoeic origin; that they exhibit either sound imitative or visually imitative features; in addition, there is frequent development of new specialized meanings which implies the necessity of distinguishing between different instrumental prefixes of common origin. The net result would be that the development of phonemes in these morphemes is not always predictable.

2.2.3. Proto-Siouan intervocalic *-p- is retained in Dakota, Mandan, also in Crow-Hidatsa and in the Ohio Valley group. There are several instances of /w/ as a *-p- reflex in Biloxi, but this is found only in morpheme alternants alongside /p/.

We reconstruct /b/ for Proto-θegiha, but Proto Čiwere- Winnebago still had -p-. In Winnebago the second vowel often disappeared, thus resulting in a final /-p/; otherwise we find /-b-/ in Winnebago. Čiwere shows /-w-/ in all cognates, a reflex which must have developed after the separation from Winnebago. Cognates illustrating development of *-p- are listed in the following paragraph.

*ápe *leaf*: Bl. hapi ~ awi Of. api Os. ábe D. apé, wápa, waxpé Č. nawe H. wiraapa.

*tápe *ball*: Bl. nitapí ~ nitawį Tu. tapi Os. tabé D. tápa H. waú·tapi; cp. also Ca. wap *to play ball*.

*topá *four*: Bl. topá Of.D. tópa Tu. to·p(a) Os. dóba OmP.K. dúba M. top Č. towe W. ǰo·p H. to·pá.

*nųpá *two*: Bl. nǫpá Of. núpa Tu. nomp Os. nǫbá ~ ðǫbá D. núpa M. nup Č. nowe

[2] Active instrumental prefixes seem to occur in all Siouan languages with the exception of Ohio Valley Siouan, where they are usually part of a stem or base. In Catawba too, some of these morphemes appear as stems.

(max) W. nųp H. ru·pa C. nu·p; cp. also Ca. nąpre *two*.

*-sipí *black*: Bl. sepí ~ supi Of. iftépi Tu. asépi Os. θábe OmP.K. sábe D. sápa M. psi (metath.) Č. θéwe W. se·p H. šipišác C. šipite.

*kᵛipé *intestines*: Bl. čiwí Of. čípi Os. cešibe D. šupé M. si·pe (max) Č. šiwe (max) H. ší·pa C. ší·pe.

*Lᵛápe *beaver*: Tu. yaop (?) Os.OmP.K. žábe D. čápa M. wárape (max) Č. lawé (max) W. rabara (?) H. wírapa; Bl. táma is probably not cognate; cp. also Ca. čap *beaver*.

*húpe *moccasin*: Os. hǫbé D. hápa M. hųpe H. hu·pa.

*-xápe *to peel, skin*: Bl. dakxópi *to cut off*, duxápi *he pulled off* Os. bažábe *to scrape*, bážabe *to peel* D. bazápa M. -xapoʔo *tear off* H. náx·apic *he chips with axe*, rúxapic *he peels with hands*.

Somewhat divergent reflexes are shown in cognates of *xupá *to lose*: Bl. kupániye (cognate?) Os. uxpáðe M. xawá·roʔoš *it's lost* H. xapa·c *he got lost*.

2.3.1. Proto-Siouan *t remains in the Ohio Valley languages; also in Dakota and Mandan.

We postulate a reflex /t/ for Proto-Crow-Hidatsa; /t/ for stressed syllables, /d/ for unstressed syllables and following nasal vowel in Proto-θegiha; /č/ for stressed syllables, /ǰ/ for unstressed syllables and intervocalically appeared in Proto-Čiwere-Winnebago before vowels e and i, /t/ is set up for all other positions in this group.

2.3.2. Proto-Crow-Hidatsa *t subsequently changed in Crow and became /š/ before e and i and became /s/ before all other vowels.

Proto-θegiha *t changed to /c/ before e and i in Osage; otherwise, the reflexes of Proto-Siouan *t remained in all dialects of the θegiha group.

The Proto-Čiwere-Winnebago reflexes of *t remained in Čiwere; however, in Winnebago, after separation, all reflexes of Proto-Siouan *t became /č/ or /ǰ/.

Cognates illustrating the reflexes of *t are listed in the following section (**2.3.3.**).

2.3.3. *tápe *ball*: Bl. nitapí ~ nitawį Tu. tapi Os. tabé D. tápa H. waú·tapi; cp. also Ca. wap *to play ball*.

*tó *blue, green*: Bl. tohí ~ tóhi Of. itóhi, ičóhi Tu. oto· Os. tóθabe, tóho OmP. to ~ tu K.Q. tu ~ tuhu D.Č. to M. tohoʔoš W. čo· H. tóʔohic C. šú·ak.

*tá *deer*: Bl. itá Tu. wita·i Of. ίya (cogn.?). Os.Č. ta D. ta *moose* W. ča; cp. also Ca. wide-.

*topá *four*: Bl. topá Of. tópa Tu. to·p(a) Os. dóba OmP.K. dúba D. tópa M. top Č. towe W. ǰo·p H. to·pá.

*tí *house*: Bl.OmP.K.Q. ti D. ti ~ típi Of. athí Tu. ati· M. tiʔiš Os. ci W.Č. či H. atí C. ašé.

*rúti *to eat*: Bl. dúti Of. túti Tu. lu·ti Os. ðacé OmP. θáta D. yúta M. rutóʔoš Č. luǰe W. waru·č- H. ru·tíc C. ruší.

*i-tąke *sister*: Bl. tąki ~ tąk *elder s.* Of. itǫ́ka Tu. tahąk Os. itǫge *elder s.* K. witǫge *younger s.* D. tąka *woman's younger s.*, tąké *man's elder sister* Č. taǫe (max) H. itaku, itawíaš *older s.* C. isahká·te *elder s.*

*áti ~ táti *father*: Bl. tata Of. atí Tu. ta·t Os. iðáci OmP. dade K. etače D. até Č. ą́je W. já·ǰi.

*natú ~ *nątu *head, hair*: Bl. nató Of. nátu Tu. natónwe, nąto·i D. natú Č. nątólušla (max) *bald* W. nasú *head*, naču *hair* H. a·t·ú C. a·šúa.

*sį́ti *tail*: Bl. síndi ~ sįt Of fį́te Os. θį́ce OmP. sinde K. sinǰe D. sįté M. šų·t Č. sǰe (max) W. sįč; cp. also Ca. di·tusisiʔ *tail*.

*Lᵛúti *red*: Bl. čti, ču·t Of. ačúti Tu. ačų·ti Os. žúce OmP. žide Dy. dúta Dt. lúta Č. súǰe W. šu·č.

*Lᵛą́ti *heart*: Bl. yándi ~ yantí Of. ičánti Tu. yą·ti Os. ðǫ́ce ~ nǫ́ce OmP. nąde D. čąté M. nátkaʔa Č. nąhǰe W. nąčgé H. rá·ta C. rá·se (Proto-Crow-Hidatsa *ra·ta).

*-kąte *plum*: Of. akǫ́ti Os. kǫ́ce OmP. kąde D. kąta W. kąč H. wakáta.

*xot- *gray*: Bl. toxká (metath.) Os. xóce D. xóta M. xo·to?oš Č. xoǰe H. xó·tac *it's real gray*, có·tac *it's gray*.

2.4.1. Proto-Siouan voiceless palatal *k^{y} changed to /č/ in the Ohio Valley group and to /š/ in Crow-Hidatsa. In Mandan it probably became /s/, but the data is insufficient for a definite statement.

In all other daughter languages k^{y} became /š/ in stressed syllables and /ž/ in unstressed syllables. Cognates illustrating these developments are listed in the following section.

2.4.2. *-k^{y}áke *hand*: Bl. čak ~ čaké Of. ičáki Tu. ha·ki (!) Os.OmP. šáge H. šá·ki C. išcé (metathesis) D. šaké *nails, claws* Č. nąwešage *fingernail* W. ša·k *fingers*.

*k^{y}úk- *dog*, later *horse*: Bl. čúki ~ čuki Of. ačúki Tu. čuk Os. šǫ́ge Q. šuke D. šúka Č. šúge (max) W. šuk H. wašú·ka C. miške (metathesis); cp. Ca. tąsi.

*-k^{y}í *to dance*: Bl. dičí Of. líči Tu. keči Os. wací OmP.D.Č. wačí W. waši H. riš·íc C. risúa; note considerable divergence in some of the daughter languages.

*Lúk^{y}a *to wash*: Bl. dučadí Of. túča Os. ðuža D. yužáža Č. waruže (max) M. kirusá?aro?oš *he washed it*.

*k^{y}ipé *intestines*: Bl. čiwí Of. čípi Os. cešibe D. šupé M. si·pe (max) Č. šiwe (max) H. ší·pa C.ší·pe.

*k^{y}į- *grease, fat*: Bl. ačíni, číšti *very fat* Of. ičí Os. šį *to be fat*, waš[*fat meat* D. šį *fat meat* M. šíre Č. was[*fat meat, pork* W. šį·.

*-L^{y}ék^{y}i ~ *-L^{y}éti *tongue*: Bl. yečí Of. iléči Tu. leči Os. ðéθe OmP. θezi D. čeží M. résike (max) Č. leǰe (max) W. re·zí H. ré·ši C. ré·še.

*k^{y}ú *feathers*: Os. mǫ́šǫ D. šų M. si Č. mąšų W. ma·šų H. wašo·ki.

2.5.1. Proto-Siouan *k remained in the Ohio Valley group and also in Dakota and Mandan.

We set up a Proto-Crow-Hidatsa reflex *k; Proto-θegiha reflexes *k preceding stressed vowels, and *g following stressed vowels; and Proto-Čiwere-Winnebago reflexes, *g medially following nasal vowel, and *k in all other positions.

2.5.2. Proto - Crow - Hidatsa *k later changed to /c/ before high vowel i in Crow. Proto-Čiwere-Winnebago *k remained in Čiwere whenever it preceded a stressed vowel, but changed to /g/ when following a stressed vowel; Proto-Čiwere-Winnebago *g which had occurred after nasal vowels, always became /ŋ/ in Čiwere; Winnebago preserved the intermediate stages of *k reflexes.

A list of cognates illustrating *k reflexes is presented in the following section (**2.5.3.**).

2.5.3. *kú *grandmother*: Bl. kųkú Of ikóni Tu. hikú· Os. ikó Q. ekąD. kúši, kúšitku Č. iku W. hikóroke, kúnika H. ikú·š.

*-tuká *grandfather*: Bl. kąxó Of. etikǫ́so Tu. hikų, kųkék Os. icígo Q. etikąD. tųká Č. hįtúgąW. čó·kaga H. arútaka (cognate ?).

*xakape *six*: Bl. akuxpé Of. akapé Tu. akasp Os.OmP. šape (syncope) D. šákpe Č. šákwe (max) W. hakéwe H. aká·wa; cp. also M. kí·ma.

*-káti *plums*: Bl. tkána ~ tokoná *peaches* Of. akǫ́ti Os. kǫ́ce OmP. kąde K. kąje D. kąta W. kąč H. wakáta.

*ra-káte *hot*: Os. dakáce P. nakade K. dakaǰe D. káta W. takač.

*áka- *on top*: Os. ágaha D. akapa *the outside*, ákapata *on outside, on top* M. á·kit Č. aháta (!) H. á·ka *top* á·kaha *on the top*.

*ká- *crow*: Bl. ą́čka Of. ǫ́ška Tu. ka·hi Os. káxe W. kaγi D. kąγí *raven* M. ké·ka *raven*.

*kó(me) *squash*: Os. kokóma H. kakúwi C. kukúwe M. kó·re.

*k^{y}áki *hand*: Bl. čak ~ čaké Of. ičáki Tu. ha·k *finger* Os.OmP. šáge *claw* D. šaké *nails, claws* Č. nąwešage *fingernail* W. ša·k *fingers* H. šá·ki C. išcé.

*k^{y}úk- *dog*: Bl. čúki ~ čuki Of. ačúki Tu. čuk Os. šǫ́ge Q. šuke D. šúka Č. šuge (max) W. šuk H. wašú·ka C. miške.

*Lʸįk- *small, young*: Bl. yį́ki Of. čįki Tu. yę́ki Os. žiga D. čįkší *son* M. konį́·ka *small animal* Č. sį́ŋe W. nį·k H. šiká·ka *big boy*, C. šiká·ka·te *little boy*.

*Lʸámąk- *mosquito*: Bl. yamakí Of. čámaki Os. ðápǫga OmP. nahąga K. yápąge D. čapáka W. nawąg-.

*Lʸáku- *road*: Of. nakóhi Os. užǫ́ge D. čąkú M. ná·ku?u.

*i-tą́ke *sister*: Bl. tą́ki ~ tąk Of. itǫ́fka Tu. tahąk Os. itǫge K. witǫge D. tą́ka, tąké Č. tąŋe (max) H. itaku C. isahká·te.

*nąk- *sitting*: Bl. nąki Of. nǫki Tu. mahanąka D. iyotąka M. kibkanak- W. mi·nak.

*amąk- *breast*: Bl. mak Of. amǫ́ki Os. mǫ́ge OmP.K. mąge D. makú Č. mąŋe W. mąg-ra.

2.6.1. The phonetic value of *q was probably ʔ or some other pharyngeal. Since a non-phonemic ʔ precedes initial vowel phonemes in several daughter languages, it is quite possible that *q occurred initially in Proto-Siouan, at least whenever the following vowel was stressed. However, this cannot be definitely established, since the earlier collectors of data did not record such a sound at all, even where later accounts tell us that it did occur. The development of Proto-Siouan *q will be considered in the chapter on clusters (**5.** below).

2.6.2. Proto-Siouan *q is reconstructed as a "defective" phoneme, which must have reached phonemic status in several Proto-Siouan dialects shortly before the time of separation. Aside from occurring as second element of clusters and preceding initial vowels, as mentioned above (**2.6.1.**), it also must have occurred medially between vowels. We reconstruct this phoneme rather than a separate series of glottalized consonants, because it is quite apparent that in those daughter languages where a glottalized series has been described[3], we are dealing with the reflexes of Proto-Siouan clusters. These clusters were of the phonemic shape of a sequence whose first element was a stop or fricative, followed by shwa, followed by ʔ, followed by vowel; the shwa was an intrusive vowel, non-phonemic, and present in the vast majority of CC sequences which occur in the Siouan languages. Only the sequence stop-ʔ in the existing Siouan languages comes close to the phonetic quality of a glottalized consonant; whenever the first element is a fricative, the sequence is phonetically a cluster.

In phonemicizing Siouan languages where such sequences occur, it was possible to analyze them as clusters, because there was not one instance in not one single language where such a sequence contrasted with a glottalized phoneme.

2.7.1. Proto-Siouan *s occurs in two isoglosses, /s/ and /c/. The latter generally remained in the Crow-Hidatsa group. The former became /š/ in Mandan.

We set up *s for Proto-Ohio Valley; stressed *s, unstressed and intervocalic *z for Proto-Čiwere-Winnebago and for Proto-*θ*egiha and Dakota.

2.7.2. Proto-Ohio Valley *s became /f/ in Ofo; Proto-*θ*egiha *s became /*θ*/ in Osage. The intermediate stages remained in Omaha-Ponca, and in Dakota and Winnebago. However, Čiwere has reflexes /*θ*/ and /*ð*/ in some cognates, retaining /s/ and /z/ in others. On the basis of the material available at present it is impossible to indicate the reason for this alternation.

As this summary shows, the development of Proto-Siouan *s does not always coincide with the groupings of the daughter languages, as outlined in chapter 1. A list of *s reflexes is given in the following section.

2.7.3. *i-sí *foot*: Bl. isí Of. čífi Tu. isi· ~ iši Os. *θ*i OmP.K.Q.Č. si W. si· D. sihá M. ši H. ſci C. icé.

[3] As for instance in S. R. Riggs, A Dakota-English Dictionary, Contributions to North American Ethnology 7.1–665 (1890); also by Boas and Deloria in Dakota Grammar, Memoirs of the National Academy of Sciences 23 no. 2.1–183 (1939).

*są *white*: Bl.D. są Of. afą Tu. asąi OmP.K. sąhą *distant white* M. šo·to?oš; cp. also Ca. tákčire *white*.

*ąsepi *axe*: Bl. ąsé·p ~ ąsépi Of. ąfépi Tu. nise·p Os. mǫ́hiθpe Q. įspe D. ąspé Č. ʃθwe H. wí-ipca (metath.); cp. also M. pášiho?oš *he sharpens*; Ca. pase *axe*.

*si-rí *yellow*: Bl. si ~ sidí Of. fi Tu. si· Os. θi OmP.Q.D. zi W. zi· M. sí·ra (!) Č. ðí H. cí·ric C. ší·re; cp. also Ca. zi.

*sįti *tail*: Bl. síndi ~ sįt Of. fíte Os. θįce OmP. sinde K. sinje D. sįté M. šų·t Č sije (max) W. sjč; cp. also Ca. di·tusisi?.

*sa-tą *five*: Bl. ksą ~ ksáni Of. kifą Tu. kisą Os. θátǫ OmP. satą D. zaptą Č. satą (max) W. sa·čą.

*sú *seed, grain*: Bl.D. su Of. ífu Os. uθú Č. θú M. sų·ta H. cu·wa.

*i-súk- *younger brother*: Bl. sųtáka Tu. wisųtk Os. iθǫ́ga OmP. isąga D. súká M. p-šųká (max) Č. súge W. hisúk H. icu·ká C. icú·ke.

*sepi *black*: Bl. sepí ~ supi Of. iftépi Tu. asépi Os. θábe OmP.K. sábe Q. šape ~ sewe D. sápa M. psi- Č. θéwe W. se·p; but H. šipišác C. šipite.

*sąni- *side*: Bl. sąhį *on other side* D. sąní *on one side* Č. sąnįǫe (max) W. sá·nig.

*umása *metal, iron*: Bl. mása ~ masí Of. amǫ́fi Tu. mąs ~ ma·s Os. mǫ́θe OmP. mąze D. máza Č. mąðé W. maza- H. ú·waca C. ú·wate (!).

*wasi- *pine*: Bl. ąsudí Tu. wa·sti· Os. báθǫhi D. wazí W. wazi ~ waži H. waci; cp. also Ca. ičiwé?.

2.8.1. Reconstructed *x had a palatal and a velar variant, the former occurring before high vowels (i, u) and after n, the latter in all other positions. Mandan retained *x. We set up a Proto-Ohio Valley reflex *x.

2.8.2. Proto-Ohio Valley *x remained in Biloxi and Tutelo, but became /s/ in Ofo.

In all other daughter languages the two variants became phonemes *x and *š shortly before separation. They remained in Crow-Hidatsa. In Dakota and Čiwere-Winnebago *x remained while *š became /š/ or /ž/. The θegiha group usually retained *x, but Osage has /ž/ in some cognates.

Specific reflexes are shown in the following section.

2.8.3. *xu- ~ *xo *rain*: Bl. xóhi ~ xohí Of. asóhi Tu. xawo·xa Os. nižiú Q. niži D. maγážu Č. nіožú (max) W. nįžú; cp. also M. xé?e H. xaré·c *it rains*; also Ca. ukso *rain*.

*xé *frost*: Bl. xedí Of. asé Os. xémǫge D. xewąka Č. xémąða; cp. also M. istųhewaheto?oš *frost* (max).

*na-xúx: *ear*: Bl. nixuxwí Of. nasúsi Tu. naxo·x Os. nixúce H. ahkúxi; Cp. D. nóγe M. nakóxe; also, Ca. tákšu *ear*.

*xuhe- *old*: Bl. xohí Of. sóhi Tu. ho·hka M. xihó?oš H. xí-e·c D. ózu *full of days*.

*xa- *rough*: Bl. xahí Os. xáxaga D. xa M. xa·xapa H. xaxá·c.

*xóti *gray*: Bl. toxká (metath.) Os. xóce D. xóta M. xo·to?oš Č. xoje H. xó·tac.

*xu- *knee*: D. xupáhu *arm, wing* M. sú·paxe (!) H. ixúax·a C. išú·še.

*xé- *to bury*: Bl. amaxí *grave* Os. waxé D. xa M. omá·xe?- *burial scaffold* Č. oxé (max) W. xé· H. rú-xišic *he plows*.

*-mąx- *to ask*: Os. ímǫxe OmP. imaxa M. kimá·xe?eš *he asks him* W. giwąx ~ gipąx H. kiwáx·uc.

*pux- *foam*: Bl. aní pupúxi M. minipúxte H. puxí

*xí *bad*: Bl. xi D. šíča M. xiko?oš Č. čéxi W. ši·šík H. išíac.

*nųxe *ice*: Os. nǫ́xe OmP. nuxe Č. nóxe H. wirúxi C. murúxe W. nų·x.

*-xapi- *to peel, skin*: Bl. dúxapi *he pulled off* Os. bážabe D. bazápa M. -xapo?o- *tear off* H. rúxapic.

2.9.1. Reconstructed *h usually remained in all daughter languages. In some cognates *h disappeared initially and may have been replaced by initial glottal stop; if this occurred, however, it is rarely observable, since initial glottal stop was not recorded by all field workers.

2.9.2. *hį *hair, feathers*: Bl. hį Of. ihí Os. hį OmP.D.Č.W. hį C. išía (!); cp. also Ca. si.

*hu ~ hi *to arrive, come back*: Bl. hi ~ hu Of. óftahi Tu. hi·, yahu·a Os. hi OmP. gi D.Č.M. hi M. hú·roʔoš *he comes* W. ji· *to come*, gu· *return* Č. gu *to come back* H. hu·c *he comes*, hi·c *he got there* C. hu·k *he comes*, híahak *he got there*; cp. also Ca. hyęʔ *to come*, mohó *there came*, mahóre *to come in*.

*hó *fish*: Bl. o Of.Os.OmP.Č. ho K.Q. hu Tu. wihoi D. hoγą M. poʔoh W. ho·.

*wahu: *bone*: Bl. ahó ~ ahú Of. áho Tu. waho·i Os. wahí OmP. įhi D. hu M. íwahu·re *his bones*

*he *horn, hoof*: Bl. ahí Of. ahé Os. he D.Č. he; cp. M. ąse *horns*, H. á·ši; also Ca. heʔ.

*hi *tooth*: Bl. įsu Of. įfa Tu. ihi· Č. ihí OmP. i Os.K.Q.D.M.W. hi H. i·š·á C. ía *his teeth*.

*hą *night*: Os. hǫ OmP.D. hą D. hąyétu W. hąxé Č. ohąžé *dark*, hąhe; cp. H. háp·e·hišic *it's evening*; cp. also Ca. hičáwa *night*.

*na-hąpe *day*: Tu. nahąp Os. hǫ́ba D. ąpa ~ ąpé M. hąpe Č. hąwe W. hą·p; also syncopated Bl. nąpi Of. nǫ́pi; cp. also Ca. yab *day*.

2.10.1. Proto-Siouan *m became /w/ in Crow-Hidatsa. It remained in the *θ*egiha group and in Čiwere-Winnebago; also, usually in Dakota and Mandan.

In morpheme initial *m disappeared in Biloxi and Ofo, but it is retained throughout in Tutelo cognates.

2.10.2. The Crow-Hidatsa reflex of *m raises the problem of the origin of Crow /m/, which seems to be phonemic. However, all the material available for this study shows /w/ as a reflex of *m for both Crow and Hidatsa. Future research with additional cognates may clarify this problem.

2.10.3. *mą- *arrow*: Bl. ąks Of. ǫ́fi Tu. mąksi· ~ mąko·i Os. mǫ OmP.K.W. mą M. má·ʔita Č. ma D. wą; cp. also Ca. wah.

*máti *bear*: Bl. ǫtí Of. úti Tu. mu·nti Os. mįcú *grizzly bear* Q. mątu D. mató Č. mątó ~ mǫžé W. mąčo; cp. also Ca. namę *bear*.

*amą *ground, earth*: Bl. ma ~ amá ~ mą Of. ámą Tu. ama·i ~ ama·ni Os. mǫ́ka D.W. mą M. mąʔąku·šta *in the earth* Č. maha H. awá; cp. also Ca. móna.

*amąk *breast*: Bl. mak Of. amǫ́ki Os. mǫ́ge OmP.K. mąge D. makú. Č. mąŋe W. mąg-ra.

*umáse *iron, metal*: Bl. mása ~ masí Of. amǫ́fi Tu. mąs ~ ma·s Os. mǫ́*θ*e OmP. mąze D. máza W. maza- Č. mąδé H. ú·waca C. ú·wate.

*amąki *to sit on ground*: Bl. mąki *lying, reclining* Of. mǫ́ki *lie down*, mąki *to sleep* H. awa·kic C. awá·cik; cp. also Ca. waʔ *sitting*.

*miha *woman*: Of. iyą Tu. mihąi D. wíyą M. mih H. wía C. wí·a.

*mąnų- *to steal*: Tu. manǫ ~ mano·ma Os. mǫδǫ́ D. manú M. manúro?oš W. mą·nú; Cp. also Ca. hinų-.

2.11.1. Reconstructed *n remained in the Ohio Valley languages and in Čiwere-Winnebago; also in Dakota and Mandan.

In *θ*egiha *n became a fricative before low nasal vowels, /*θ*/ in Omaha-Ponca and /ð/ in Osage. In other positions *n remained in this group.

In Crow *n was retained in morpheme initial, but became /r/ medially; in Hidatsa, all *n reflexes became /r/.

2.11.2. *natu *brain, head*: Bl. nató Of. nátu Tu. natónwe ~ nąto·i D. natú W. nasú, naču *hair* Č. nątólušla *bald* (max) nąsonije *headache* (max); but H. a·t·ú C. a·šúa.

*nąk- *standing*: Bl. nanki *sitting* Of. nǫ́ki *to stay* Tu. nąka Os. nǫžį *to stand* W. nąžį Č. nąŋe *sitting*; but D. yąká *to be, exist* M. -hąk *standing*; cp. also Ca. rare *to stand*.

*ni- *breath, to breathe*: Bl. níxta *breath* Of. nasíhi *to breathe* Os. niǫ *breath* OmP. niu *breath* D. niyá M. ní·heʔeš *he is breathing*.

*nųpa *two*: Bl. nǫpá Of. núpa Tu. nomp

~ nompa Os. nǫbá ~ ðǫbá K. nompa D. núpa M. nup Č. nowe (max) W. nųp H. ru·pa C. nu·p; cp. also Ca. nąpre *two*.

*wa-nąx- *ghost*: Bl. anačí Of. įčonáči Tu. wanánči Os. wanǫ́xe OmP.K. wanaxe D. wanáγi M. manú·xike W. wanaxira.

*ini- *to live*: Tu. ini· Os.Q.D. ni M. i·ni-*alive* W. į H. iric C. iri; cp. also Ca. wa?mųrire *to live*.

*nųx- *ice*: Os. nǫ́xe OmP. nuxe Č. nóxe (max) W. nų·x H. wirúxi C. murúxe; cp. also Ca. mǫhi *ice*.

*mąną- *to steal*: Tu. manǫ ~ mano·ma Os. mǫðǫ́ OmP. mąθą́ D. manú M. manúro-?oš W. mą·nú; cp. also Ca. hinų-, hi·núyetá *steals*.

2.12.1. Proto-Siouan *w remained in Dakota and also in Crow-Hidatsa and Čiwere-Winnebago.

Tutelo has a /w/ reflex; Biloxi and Ofo retain *w medially but in morpheme initial *w disappears in some cognates.

The Mandan reflex is /ɱ/. θegiha usually retains *w, but there are some cognates showing /m/ and /b/; this could be the result of a β allophone of *w in this group.

2.12.2. *wa- *snow*: Bl. wahú Os.K. ba OmP. ma D.H. wa W. wara; but Č. pa; cp. also Ca. wo·?.

*wą- *man*: Bl. ąyá Of. ąkwa Tu. waiwáx, máwaka Os. wǫ *someone* D. wą- *some, one* M. núma?ak W. wąk Č. wą́ǫe H. wacé C. wacé·.

*wasi- *pine*: Bl. ąsudí Tu. wa·sti· Os. báθǫhi D. wazí W. wazi ~ waži H. waci; cp. also Ca. ičiwé?.

*awaxi- *fog*: Of. abasíska M. masí?iš H. áwašic; but D. op?ó ~ p?o *fog, steam*.

*wuse- *dry* has been freely metathesized in several daughter languages: Bl. uxwí Of. ósi Os. -bíθe Č. búðe H. ú·cic; cp. D. púza.

2.13.1. *L symbolizes a liquid, occurring in Proto-Siouan dialects either as /l/ or /r/. Its two principal allophones are d, occurring initially in unstressed syllables; and r, a single flap dental which occurs in all other positions; l occurred instead of r in some dialects. *L remained as /r/ in Crow-Hidatsa and in Winnebago; as /l/ in Čiwere.

2.13.2. We postulate two Ohio Valley isoglosses, *d and *l, to account for /d/ in Biloxi, /t/ in Ofo, and /l/ in Tutelo.

In Santee Dakota /y/ is the usual *L reflex, replaced by /d/ in a few cognates; Teton Dakota preserves the older /l/.

*L became /r/ in Mandan before high vowels, but it changed to /n/ before low /a/.

We set up the following Proto-θegiha reflexes: preceding stressed vowels, two isoglosses, *ð- and *y-; following stressed vowels, a reflex *d-. Subsequently, *ð remained in Osage and became /θ/ in Omaha-Ponca; *y- remained in Kansa. Proto-θegiha *d remained in Osage and Kansa; it changed to /n/ in Omaha-Ponca.

A list of cognates illustrating these changes is presented in the following section (**2.13.3.**).

2.13.3. *Lóti *neck, throat*: Bl. dódi Of. ičóti Tu. loti Os. dóce OmP. nude K. duje Q. dute Ds. doté Dt. lote W. ró·xira; but Č. taše.

*Le *to go*: Bl. de Of.te Tu. la, xala Os. ðe OmP. θe K. ble *I go* D. ya (Teton la) M. re·- Č. lé W. re H. re·c C. re·; cp. also Ca. dane, dare.

*Lamni *three*: Bl. dáni Of. táni Tu. na·ni ~ la·ni Os. ðábðį OmP. θabθį K. yablį D. yámni M. ná·mini H. rá·wi; but Č. táni (max) W. ta·ní; cp. also Ca. nómna.

*Lu-tka *to touch*: Bl. tučé D. yut?á M. rútke?eš W. ru·jga- H. rúhtiš·ic C. rucíre.

*La-tką *to drink*: Os. waðátǫ D. yatká W. račká Č. latą.

*Lutka *pigeon*: Bl. utí Of. ačúta Tu. wayu·tka·i Os. ðita W. ručge; cp. also Ca. túsi *dove*, itúse *dove, hawk*.

*uLaki- *to tell*: Of. óktaki Os. uðáge OmP. uθá D. oyáka M. ki-ná?aro?oš *he tells him* Č. uláge W. ho·rag- (wo·tak *I tell*); cp. also Ca.-nąk-.

*Lu-tą *to pull*: Bl. duxtá Tu. ludi Os.

ðídǫ D. yutítą M. orúptiko?oš *he pulled it down* H. rúta·c *he pulls it apart.*

*Lumni- *to twist, turn*: Bl. duní Of. atubaniči Tu. luní Os. ðibébðį D. yumni M. rú·miniro?oš H. rúwiric.

2.14.1. Reconstructed *L^{y}, a palatal liquid, occurs in Proto-Siouan in three main allophones: ny before nasal vowels, r preceding and/or following i; and ry or ly in all other positions.

L^{y} became /r/ in Crow-Hidatsa. We set up a Proto-Ohio Valley reflex *y to account for /y/ in Biloxi and Tutelo and for /č/ in Ofo. The Dakota reflex of *L^{y} is /č/ in most cognates.

2.14.2. Before nasal vowels *L^{y} became /n/ in Mandan and in Winnebago; also, as a rule, in Čiwere. Before oral vowels *L^{y} reflexes are /r/ in Mandan, Winnebago, and in Čiwere.

Preceding a stressed vowel *L^{y} became /ž/ in all languages of the θegiha group; before unstressed nasal vowel, it became /ð/ in Osage and /θ/ or /n/ in Omaha-Ponca.

The following section (**2.14.3.**) contains a list of cognates, illustrating development of *L^{y}.

2.14.3. *L^{y}uti- *red* shows slightly divergent reflexes: Bl. čti ~ ču·t Of. ačúti Tu. ačú·ti Os. žúce OmP. žide Dy. dúta Dt. lúta Č. suje W. šu·č.

*L^{y}ą *wood*: Bl. ayą Of. ičǫ Tu. miyęi ~ miyę Os. žǫ OmP. žą Q. yǫ D. čą M. mána Č. ną W. ną· H. wirá C. waré; cp. also Ca. yap *wood.*

*-L^{y}- *to sleep*: Bl. yąni Tu. hiyą Os. žǫ OmP. žą D. šą *sleeping* M. hána?aro?oš Č. iyą (max) W. ną· H. hírawic C. iháwi; cp. also Ca. hi·máre.

*L^{y}įk- *small, young*: Bl. yįki Of. čįki Tu. yęki Os. žiga D. čįš *son*, čįčą *child, young* M konį·ka *young animal* Č. sį̨ŋe W. nį·k H. šiká·ka *big boy* C. šiká·ka·te *little boy.*

*L^{y}o *flesh, body*: Bl. yo ~ yoyá Of. įčó ~ įčo Tu. yuxtéki Os. žúiga, tážu OmP. žu D. čó- Č. iló W. ro·rá M. ropxí?i *hide, skin* H. raxpé *skin* C. raxpé *skin*; cp. also Ca. wi·dyo *meat.*

*L^{y}ák^{y}i *name*: Bl. yáče ~ yačí Os. žáže OmP. ižáže D. čažé Č. láye W. ra·š M. rasé H. rá·ši (max).

*-L^{y}éki ~ -L^{y}éti *tongue*: Bl. yečí Of. iléči Tu. leči ~ neči Os. ðeθe OmP. θezi D. čeží M. résike (max) Č. léje W. re·zí H. ré·ši C. ré·še; here, the underlying form for Of.Os.OmP. is *iL^{y}éti.

*L^{y}ąmąke *mosquito*: Bl. yamakí Of. čámaki Os. ðápǫga K. yápąge OmP. nahąga D. čapǫ́ka W. nawąg-.

*L^{y}ątí *heart*: Bl. yándi ~ yantí Of. ičánti Tu. yą·ti ~ yanti Os. ðǫ́ce ~ nǫ́ce OmP. nąde K. nąje D. čąté M. nátka?a Č. náhje W. nąčge H. rá·ta C. rá·se.

*L^{y}ąní *tobacco*: Bl. yaní Of. ičáni Tu. yé·ni Os. nǫníhi Q. tani Ds. čądí Dt. čąlí M. manáš Č. lanehí *to smoke* (max) W. tá·ni.

*L^{y}axú *lungs, lights*: Bl. yakxú Os. ðáxi D. čaγú W. ra·xóra H. rá·xu C. rá·xe.

ON THE HISTORICAL DEVELOPMENT OF CERTAIN LONG VOWELS IN CREEK

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1. Introduction
2. Creek long vowels < PM *-V¹kV²
3. Creek secondarily shortened vowels
4. Creek long vowels < PM *-V¹kʷV²
5. Additional reconstructions
6. Corrections of some previous reconstructions

1. Many long final vowels of Creek words can be shown to have developed from the Proto-Muskogean sound group *-V¹kV² which contracts to -V²· in Creek. Thus PM *-aki and *-iki > Cr. -i·, PM *-aka > Cr. -a·, and PM *-iku and *-uku > Cr. -u·. Other possible combinations exist but examples of them have not yet been found. The formulation of this sound law enables us to make more exact reconstructions of certain PM forms.

Rules for the development of the final PM *-V¹kV² group are given below for Choctaw, Alabama-Koasati, and Hitchiti, as well as for Creek.

2. If the PM reconstructed form is DISYLLABIC, the original sound cluster *-V¹kV² is retained in Choc. and in Ala.-Koas., is represented by -V¹k- in Hitch., and becomes -V²· in Cr., e.g.

(1) PM *Naki *arrow*: Choc. naki; Ala.-Koas. łaki; Hitch. -łaki-i;[1] Cr. łi·. If the reconstructed form is TRISYLLABIC the original sound group is probably retained in full in Apalachee[2] (one example: see no. 5 below), but all trace of the final vowel is lost everywhere else except in Cr., while the k is lost everywhere else except in Choc. and Hitch., e.g.

(2) PM *ukcaki *hickory*: Choc. uksak, ussak; Ala.-Koas. uca; Hitch. u·cak-i; Cr. ucí·. The Ala.-Koas., Hitch., and Cr. forms are the result of ungemination from an earlier *uccaki.[3] The initial long vowel in Hitch. results from the fact that Hitch. lengthens the vowel of an initial OPEN syllable (contrast nos. 2 and 3 with no. 5 below).[4]

(3) PM *niNaki *night*: Choc. ninak; Ala.-Koas. niła-hasi *moon* (< *night-luminary*); Hitch. ni·łak-i; Cr. niłí·.

(4) PM *-pisiki ~ -pinsiki *breast*; Choc. -pi·ⁿšik; Ala.-Kosa. -pisi; Cr. -pisí·. (These forms are quoted with a preceding hyphen because they are always used with a possessive prefix in all the languages.)

(5) PM *nihtaka *day*: Choc. nittak; Apal. nihtaka;[5] Ala.-Koas. nihta; Hitch. nihtak-i; Cr. nittá·. Choc. and Cr. show gemination to tt < *ht.

(6) *takiki (metathesized form: *katiki) ~ *tayiki *woman, female*: Choc. te·k (phonemically teyk ?) < earlier *tayk; Ala.-Koas.

[1] The Hitch. form is preceded by a hyphen because it is used with a possessive prefix. The final -i in this form is set off by a hyphen because it is a suffix used with all Hitch. nouns and is not to be traced back to the final vowel of the reconstructed form.

[2] The paucity of material on Apalachee (now extinct) makes it impossible to know for certain whether this sound group is always retained in full or not. See Mary R. Haas, The Position of Apalachee in the Muskogean Family, IJAL 15.121–127 (1949).

[3] See p. 52, Table 18 in Haas, The Classification of the Muskogean Languages, in Language, Culture, and Personality, ed. by Leslie Spier, pp. 41–56, Menasha, Wisconsin, 1941.

[4] Ibid., p. 48, Table 9.

[5] In an earlier paper I was uncertain as to whether Apal. nihtaka (nihtaga) was the stem form without any added suffix or not; Haas, Position of Apalache . . . , p. 124, reconstruction no. 6, footnote 17. The new evidence brought forth in this paper solves that problem. The Apal. nihtaka is the stem form without added suffix and the PM reconstruction must be corrected from *nihtak to *nihtaka.

tayyi; Hitch.-Mik. tayk-i; Cr. huktí·. The Creek word, though not now a plural form, contains an old plural prefix hu-; cf. Cr. hunánwa *man, male* (compare with Choc. nakni, Ala.-Koas. na·ni *man, male*). For comparative purposes, then, the stem of the Cr. word is -kti· < PM metathesized *katiki with secondary loss of the vowel of the first syllable. The Choc., Ala.-Koas., and Hitch.-Mik. forms point to a reconstruction *tayiki with loss of the i in the second syllable and, in Ala.-Koas., with gemination to yy < yk. The Creek form, on the other hand, points to *katiki metathesized < *takiki. The variation between k and y in the alternative reconstructions cannot at present be explained.

3. The evidence given above is of such a nature that, given a Choc. form ending in k and a cognate Cr. form ending in a long vowel, the full PM final sound group can normally be safely reconstructed without any further data. This is due to the fact that V^1 of the PM *-V^1kV^2 group is retained in the Choc. form while the nature of V^2 can be determined from Cr. (see nos. 2, 3, 4, and 5 above).

There are, however, certain Creek words ending in a SHORT vowel which are cognate with Choc. forms ending in k. Why are vowels short in Creek? A good working hypothesis seems to be the following: If the reconstructed PM form ending in *-V^1kV^2 is QUADRISYLLABIC, Creek has V^2 secondarily shortened from an earlier *-V^2·. Note the following sets of cognates:

(7) PM *watulaka ~ *watunlaka *crane (bird)*: Choc. watunlak; Koas. watula; Cr. watúla. Hitch. has a word watul-i of the same meaning, but this is evidently a borrowing from Cr. since it fails to show lengthening of the vowel of the initial open syllable and lacks the -ak- normally retained in Hitch. (cf. nos. 2 and 3 above).

(8) PM *k^{w}iya·nkaka *hawk*:[6] Choc. biya·ⁿkak; Koas. biyakka; Cr. kiyá·kka.

(9) PM *x^{w}itukhaki *yellowhammer*: Choc. (B) fitukhak; Koas. fitukku; Cr. fitúkki. Koas. and Cr. show gemination to kk < *kh. The PM final sound group is reconstructed as *-aki because of the final -i in Cr., which we assume to be secondarily shortened from earlier *-i·. The final -u of Koas., however, remains unexplained. On the analogy of similar forms in Koas. we would expect *fitukka rather than fitukku, the form we actually have. Possibly the final -u is to be explained as having assimilated to the u of the preceding syllable.

(10) PM *ihistuku *ashes, potash*: Choc. hittuk; Koas. histu; Cr. í·ssu. The quadrisyllabic nature of the PM form is assumed here to explain the long vowel of the first syllable in Creek, since PM *-VhV regularly contracts to Cr. -V·, e.g. PM *k^{w}ihi *mulberry* > Choc. bihi, Cr. ki·. Note also that Choc. shows gemination to tt, Cr. to ss, both from *st.

At first I reconstructed forms like those illustrated above with a final k in PM. I now believe such reconstructions are incomplete and that Choc. final k normally points to a lost final vowel.[7] However, without the hypothesis given at the beginning of this section it would be impossible to deduce the nature of the final vowel. The only debatable point is whether we are justified in assuming that Creek long final vowels can be secondarily shortened.

In this connection it is worth mentioning that there is other evidence pointing to the secondary shortening of long final vowels in Creek. One type of evidence is found in the

[6] Since it is possible to show that many long vowels in the Muskogean languages are of secondary origin, there is some question in my mind about the validity of any reconstructed PM long vowel, including the one we have in the second syllable of this reconstruction. However, there is at present no satisfactory way of explaining as secondary a long vowel which occurs both in Choc. and in Creek.

[7] It is even possible that this loss may be fairly recent; note, for example, Choc. wa·k *bovine* as against Cr. wa·ka, both borrowings from Spanish vaca.

fact that variant Creek dialects sometimes show a long final vowel in one dialect beside a short final vowel in another dialect,[8] e.g.

'tafussú· ~ 'tafússu *red or cedar elm*

alá· ~ ála *buckeye bush*

Another type of evidence is seen in the regular morphophonemic rule whereby the final long -i· of Creek adjectives (participial forms) is regularly shortened when these adjectives enter into composition with a preceding noun, e.g.

istihátki *white man* < ísti *person* + hátki· *white*

itulá·ni *bois d'arc* < ítu *tree* + lá·ni· *yellow*

4. Having demonstrated in the preceding sections that PM *-V^1kV^2 > Cr. -V^2·, and having demonstrated in a previous paper[9] that PM *k^w > Cr. k, the question then arises whether PM *-$V^1k^wV^2$ also > Cr. -V^2·. The evidence that has been assembled up to this point is too meager to be completely conclusive, but I believe the following set of cognates points to an affirmative answer, viz.

(11) PM *(k)usik^{w}a *poke weed*: Choc. kušiba; Koas. kusiba; Cr. usá·. Although the loss of the initial k in Cr. remains unexplained, everything else fits too neatly to be accidental. (Other evidence for the occasional loss of initial k in Cr. is found in the dialectal forms[10] katassa ~ atassa *war knife*.)

5. There now remain two other sets of cognates which pose problems related to the proposed PM *-V^1kV^2 and *-$V^1k^wV^2$ reconstructions discussed in the preceding sections. There is one interesting set of cognates wherein Cr. shows a long final vowel though the other languages provide no independent evidence for reconstructing *-V^1kV^2, *-$V^1k^wV^2$, or *-V^1hV^1, the most likely prototypes for a Cr. long final vowel, viz.

(12) PM *niha(k^{w}a) *fat, grease*: Choc. niya; Ala. niya, Koas. niha; Hitch. ni·h-i; Cr. nihá·. Note that in Choc. and Ala. PM *h is replaced by y after a preceding i-vowel.

The final syllable of the above reconstruction is placed in parentheses because only Cr. contains evidence for this part of the reconstruction. I assume the final group to have been *-ak^{w}a rather than *-aka or *-aha solely from evidence which lies outside the Muskogean family of languages. Natchez, which I believe to be related to this family,[11] has a word nehk^w *fat* which is probably related to the Muskogean set of cognates given above.[12] However, this does not entirely solve the problem as to whether *-ak^{w}a or *-aka is the better reconstruction here, because it is possible that a better understanding of the relationship between Natchez and Proto-Muskogean will reveal that Nat. k^w sometimes corresponds to PM *k rather than *k^w.

There is another set of cognates which poses another type of problem. In a previously proposed reconstruction for the word for *brier*[13] a long final vowel was set up in PM solely on Creek evidence. Since the evidence presented in this paper casts serious doubts on all such reconstructions, I hereby propose a new reconstruction, viz.

(13) PM *k^{w}ak(i)cu ~ metathesized form *k^{w}ac(i)ku *brier*: (Choc. bissa, doubtfully cognate); Koas. bakcu; Hitch. bakc-i; Cr. kacu·. The second vowel is placed in parentheses because its true nature is unknown; a vowel is necessary here, however, because

[8] See no. 16, p. 71 in Haas, Dialects of the Muskogee Language, IJAL 11.69–74 (1945).

[9] Development of Proto-Muskogean *k^w, IJAL 13.135–137 (1947).

[10] See Haas, Dialects . . . , no. 9, p. 71.

[11] See also John R. Swanton, The Muskhogean Connection of the Natchez Language, IJAL 3.46–75 (1924).

[12] Natchez forms quoted in this paper are taken from my own field notes on that language. Further evidence demonstrating the Natchez-Muskogean relationship will be given in a paper which is now in process of preparation.

[13] Haas, Development of Proto-Muskogean *k^w, reconstruction no. 3, p. 135.

of our new interpretation of the Creek evidence. The Choc. term is very puzzling; it might be considered cognate if we permitted ourselves to assume a rather unlikely series of metathesizations of vowels (viz. bissa < *k^{w}ikca < *k^{w}ikuca < *k^{w}akicu). On the other hand, such an assumption may have a certain amount of validity since it would yield confirmation for the assumed i-vowel in the second syllable of the reconstruction. Natchez we· *brier* throws no light on the problem.

6. The new evidence on the development of long vowels in Creek brought forth in this paper makes it possible to correct or amplify some of the PM reconstructions given in previous papers. In particular it should be noted that I now reconstruct PM *nihtaka *day* (correction in place of *nihtak),[14] PM *k^{w}iya·nkaka *hawk* (correction in place of *k^{w}iya·nkak),[15] and PM *k^{w}ak(i)cu ~ *k^{w}ac(i)ku *brier* (correction in place of *k^{w}akcu·).[16]

[14] See footnote 5 above.

[15] Development of Proto-Muskogean *k^{w}, reconstruction no. 5, p. 136. See also the comments made in footnote 6.

[16] See footnote 13.

BANNACK I: PHONEMES

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0. Phoneme classes
1. Syllable, stress, and tone
2. Syllabics
3. Non-syllabics

0.0. There are in Bannack the following phonemes:

Syllabics { i ə a o u
- - - - - - - -/·/

Supralinear: Tone 1, Tone 2

Non-syllabics { p, t, k c, č, kw
b, d, g ʒ, ž, gw
m, n, ŋ w, s, h
ʔ

0.1. The syllabics include five vowel phonemes and distinctive length. Each vowel phoneme may occur in initial, medial, and final position. Length which is syllabic but not a vowel phoneme appears in medial and final positions. A non-syllabic is any other linear phoneme.[1]

Examples of vowel phonemes in initial, medial, and final positions are:

(1) ìná *to cut meat for drying*, ènáˑ *very, real*, àní *ant*, ònábi *salt*, ùnáˑ *far away*;

(2) kìmá *to come*, kèˑmá *border* (cf. nèˑmə *people*, but nèmí *we, excl.*, nèmá *to feel*, etc.), kàmə́ *rabbit*, kòmíˑba *the clear sky*, kùmá *male, husband*;

(3) mògóni *woman*, wètánə *to beat berries from a bush*, pə́ˑna *duck*, wètáno *winnow basket*, tèsóŋažanu *skin-scraper*.

Sequences including the remaining syllabic, namely /·/, are of the following three types: (1) (±C)V·CV, (2) (±C)V·ʔV, (3) (±C)V·#.

[1] It is interesting to notice that a syllabic also may constitute a morpheme, as follows: nàká *to listen*, nàkáu *to hear* (momentaneous), nàkáˑ *listen!* (imperative), inàkáˑ *listen to me!*, unàkáu *he heard it*.

Examples of these sequences are:

(1) ə́ˑkaˑ *you (subjective) there*—əkáuba *your legs*, ùnáˑtu *to some place far away*—ùnátu *to some place in the vicinity*;

(2) àˑʔúˑ *whether (dubitative)*—àʔúˑ *why (interrogative)*;

(3) ìwáˑ *much, very many*—ìwá *plenty, many, a few*, òʔóˑ *over there (invisible)*—òʔó *there (visible)*.

Additional examples with contrasting short vowels are given above after hyphens.

0.2. Of the supralinear phonemes, Tone 1 is high tone under full stress, and Tone 2 is low tone under full stress. Stress itself is subphonemic.

Examples of Tone 1 (marked ´) and Tone 2 (marked `):

náˑdəkwai *side, quarter*—nàˑdə́ˑkwi *to tell a story*, ináˑ *my father*—ìnáˑ *somewhere right here*, inàká *my ear*—ìnáka· *he is somewhere here*, múʔa *tomorrow*—mùʔá *mother's mother, daughter's child (w. sp.)*.

0.3. The non-syllabics include ten consonant phonemes, namely /p, t, k, c, č, kw, w, m, n, s/, which occur initially and medially, six consonant phonemes that are homorganic correspondents to six of the former, namely /b, d, g, ʒ, ž, gw/ which occur medially only, and three others, namely /ŋ, h, ʔ/ which occur medially only.

Examples of consonant phonemes in initial position:

páˑ *water*, tàbá *sun*, kái *negation*, càbí *to stick to*, čáu *here*, kwàná *to smell*, wàházu *two (subj.)*, màká *to feed*, nàká *ear*, sàdə́ˑ *dog*.

Examples of consonant phonemes in medial position:

(1) àpí *to lie down*, sətá *morally bad*, nàkí *to begin to chase*, pàcá *to kill one*, tàhíča *deer*, sàkwá *several cry*;

(2) àbí *to be lying, to be asleep*, sədá *bad*,

inferior, nàgí *to chase*, tàʒá *summer*, pìʒá *good*, sàgwái *bad, evil.*

Examples of ŋ, h, and ʔ in medial position: càŋí *to hang*, iwàŋá *my younger brother*; tàmáhi *to fight*, wàhá *grass*; čàʔí *to die*, àʔá·*horns.*

1.1.1. When referring to a syllable in Bannack we mean either a sequence of the type (±C)V±/·/, e.g. u.tà.pá *his mouth*, u.kwó· *his head*, or a sequence of the type (±C)V_1V_2, when V_1 has the same tone as V_2, e.g. óu.ka· *he there, that one*, nòu.bí.kai *to have a house, to dwell.* This means that a Bannack syllable consists of a vowel, short or long, or one of the permissible clusters of two short vowels with the same tone, or of such a syllabic nucleus preceded by a consonant. The morphology of the language indicates that there can be no syllable ending in a consonant. Every morpheme terminates in a vowel, as does every word and every utterance.

1.1.2. With a prosody we mean a phoneme, consolidating a syllable as defined above. Of these phonemes there are three: /ʔ/, Tone 1, and Tone 2. Intervocalic glottal stop is mutually exclusive with Ø; Tone 1 and Tone 2 are mutually exclusive with each other and with Ø; /ʔ/ occurs in a syllable with Tone 1, or with Tone 2, or with zero tone. Thus, a Bannack syllable, fully stated, is either (±C)V±/·/±/ʔ/± tone, or (±C)V_1V_2±/ʔ/±tone.

1.1.3. Syllabic division in sequences of the types (±C)VŋV and (±C)VhV is left undetermined in the present study.

1.2.1. Stress in Bannack is free, i.e. there is no general rule that fixes a main stress of a word to a certain syllable in one and the same order for every sequence.

There are four degrees of stress: loud stress (phonetically marked ˊorˋ), medial stress (phonetically marked ˈ), weak stress (unmarked) and zero stress (unmarked). Zero stress occurs only in phrase final. A long vowel may be weakly stressed only in a final position, but is otherwise loudly or medially stressed. The second mora of an weakly stressed long vowel and a vowel under zero stress are as a rule unvoiced. Loud stresses are here called 'full' or 'primary' stress; medial stress is called 'half' or 'secondary' stress; a vowel under weak stress or zero stress is called 'unstressed'.

1.2.2. A short vowel is counted one mora, a long vowel (V+/·/) is counted two morae. A long vowel may be heard rearticulated.

Except within duosyllabic stems (free forms or head-constituents), stresses follow one another in rythmical patterns according to the law of alternating stresses as in other Shoshonean languages. This means that the sequence of stressed and unstressed syllables depends on the number of syllabic morae within the sentence, and that a long syllable is theoretically stressed only in one of its two morae.

Within a long monophthong the stress may be equally distributed over the two morae, or it may shift from one to the other in free variation: [pá· ~ pá·A ~ paá·] *water*. The same free alternation of stress occurs in tautosyllabic vowel-clusters, e.g. [ˈímá·I ~ ímaí] *my hand*, [kàɟβʊɾ̥k·áana] ~ [kàɟβʊɾ̥k·aána] *he had no eyes.*

1.2.3. Within a stem or an independent particle two consecutive one-mora syllabics may be fully and equally stressed, but if so each one of these syllabics contains different tone, e.g. nàmá *to hurry*, sùá *to consume, to finish*, tàká *to eat*, kàmá *rabbit*, òhó *bone.* It cannot be said that either the one or the other of the vowels in these words has more weight than the other. In composition primary stress (or stresses) falls on the head-constituent, and secondary stress falls on every second ("even") vocalic mora in a phrase in addition to the primary stress (or stresses) on the stem vowel (or vowels) of the head-constituent, e.g. nàmásuátəkási

(*hurry-finish-eat-subord.*) *if you hurry up eating,* kàmə́ʔohò *rabbit-bones,* ímáimà *with my hand.*

1.3.1. Distinctive syllabic tone is superimposed on free forms and on the head-constituent of composed forms but is not discernible in dependent morphemes. In composition stress is movable according to even numbers of vocalic morae, but tone is fixed, i.e. a stem-vowel that has potentially high tone is heard with high tone when fully stressed, and a stem-vowel that has potentially low tone is heard with low tone when fully stressed. High and low tone do not alternate.

In disyllabic words with Tone 2 on the first and Tone 1 on the second syllable the distribution of stress is even, e.g. tàbí *day,* tə̀ká *to eat.* In composition any one of them may retain or lose its stress (and consequently also its tone) as a result of stress alternation, e.g. tàbídə̀ká *to eat dinner,* tàbídə̀kawə̀nə *he is eating dinner.*

As a feature of one segment or of a bisegmental vowel cluster, tone is distributed over the syllable, but it is marked only once, i.e. over the first syllabic segment, if this segment is the first of two within a tautosyllabic vowel cluster, e.g. upía *his mother,* umòubí *his nose.*

1.3.2. It follows from the above said that a Bannack word, composed of more than one syllable, possesses a definite stress-and-tone pattern. The lexical tone-accent may be modified by superimposed intonation but only in a limited way, since distinctive lexical pitch may be reduced in a given syllable and concordantly increased in another because of the movability of the syntagma stress, but no tone-accent can be exchanged for another, unless the morpheme or the sequence of morphemes which make up the word enter into a larger composed form, e.g. ùŋá· *baby,* pà·úŋa· *the water-baby* (*a water-spirit*).

2.1. Discounting sentences where a final vowel of a free form precedes a differently accented vowel of another free form, there are no clusters of two identical vowels contrasting with V·. It is thus possible to regard any long vowel as a bisegmental cluster, i.e. to analyze V· as V+V, and to state that there is no length phoneme in the language. This analysis would be supported by the following facts:

A two-mora vowel has the same prosodic qualities as does a tautosyllabic cluster of two different vowels (the vowel having the same tone in both its morae, but each mora being stressed independently). A vowel which is long by non-distinctive reduplication may be heard as identical V+V. Identical V+V may produce V in sandhi. Grammatical reduplication equals vowel minus length, if any, and may thus be regarded as affecting only the first component of a bisegmental vowel-cluster, if the reduplication is initial, and only the second, if the reduplication is final.

In contrast to the above analysis, since each of the five vowels occurs as V_1V_1 as against V, with the same distribution for both, V_1V_1 may be said to equal V+/·/. The use of a separate length-phoneme instead of a double series of vowel phonemes has the advantage of reducing the necessary number of symbols for the accents. It further simplifies the statements of morphophonemic alternation, since morpheme-final /·/ may function as a morphophoneme contrasting with Ø, i.e. /·/ sometimes functions as a separate morpheme.

2.2.1. Each of the five simple vowels may form clusters with any one of the others. Since morphemes may begin and end with any of the five vowel phonemes, sentences with clusters of two homorganic vowels occur when contrasting accentuation protects the vowels from becoming merged in sandhi. As a result of derivation or compounding, all combinations are possible.

2.2.2. Permissible vowel clusters within a morpheme are more restricted and appear as glides ending in /a/, /i/ or /u/.

Such clusters may be found as disyllabics, i.e. the two components may have different tone, contrasting accents, e.g. sìása *grow up*, cə̀á *girl*, hòámai *to hunt*, tùáki *children*, kòípə *a dead person*, čùí *warm*.

Each of these clusters also occurs as a tautosyllabic, i.e. the two components have the same tone with free alternation of stress, they share the accent, e.g. pía *female*, tànóa *to fall*, móasu *already*, čàdúa *to speak*, ói *in there*, upúi *his eyes*; compare the following phonetic examples: [ʊp̚·ú·ɪ] *his eyes*, [ʈi̯p̚·ʊi̯ʈ̚·ʊ] *over his eyes*, [ʈɪ·aβʊ̀·ɪ, ʈïá·βʊi̯] *serviceberries*, [màʂú·ɪk·á·, màʂʊ́k·á·] *he maintained*.

The following seven have been found as diphthongal glides:

əi̯	-	iu̯	ou̯
ai̯	oi̯	əu̯	au̯

Short i has not been recorded as a semivocalic glide after u, but short i may be heard semivocalic before u, so that [i·u̯] and [ju·] occur in free variation with [iu]. In the other six the second component may or may not be heard as a spirant, so that V+i̯ occurs in free variation with V+i, and V+u̯ in free variation with V+u.

Examples:

[ʈi̯·i̯p̚ɛ̀, ʈi̯ɪ́·p̚ʻÉ] *ground, earth*, [i̯·má·I, i̯·mai̯] *my hand*, [i̯·mái̯ma] *with my hand*, [ʈi̯gɔ́·i̯kʻWÉ, ʈi̯gɔi̯kʻWÉ] *it will kill several*; [mí·u̯kɨ̀·A] *he said*, [mi̯ú·ʔën·i̯] *he said speaking*, [žàʔɪ́U] *he died*, [žàʔi̯·úʂI] *after he died*, [ʂi̯ɪ̀mɛ̃̀·u̯c·i̯ʔI, ʂi̯mɛ̃́úc·i̯ʔI] *one only*, [kɨ̀im·á·u̯, kɨ̀m·á·U] *to arrive, to leave*, [kɨ̀m·á·u̯sI] *when he came*, [ʈɔ̀uγí, ʈɔ̀u̯gí] *enough*.

2.2.3. No clusters of V+V as against V·+V, or V+V·, have been found within morpheme boundaries where subphonemic length is not interchangeable: [V_1V_2] ~ [V_1·V_2] ~ [V_1V_2·]. Consequently, the number of morae in such a vowel cluster cannot exceed the number of organically different segments in the sequence.

The general rule, then, for the formation of vowel clusters is: V_1V_2 = /V_1/+/V_2/; but when V_1 = /i/ followed by /u/, then V_1 = [i] ~ [i̯]; and when V_2 = /i/ (not preceded by /u/) or /u/, then V_2 = [i,u] ~ [i̯,u̯].

3.1. The non-syllabics include ten consonant phonemes, namely /p, t, k, c, č, kw, w, m, n, s/, which occur initially and medially, six consonant phonemes that are homorganic correspondents to six of the former, namely /b, d, g, ʒ, ǯ, gw/ which occur medially only, and three others, namely /ŋ, h, ʔ/ which occur medially only.

Examples of consonant phonemes in initial position:

pá· *water*, tàbá *sun*, kái *negation*, càbí *to stick to* čáu *here*, kwàná *to smell*, wàpí *two lie down*, màká *to feed*, nàká *ear*, sàdó· *dog*.

Examples of consonant phonemes in medial position:

(1) àpí *to lie down*, sə̀tá *morally bad*, nàkí *to begin to chase*, pàcá *to kill one*, tə̀híča *deer*, sàkwá *several cry*;

(2) àbí *to be lying, to be asleep*, sə̀dá *bad, inferior*, nàgí *to chase*, tàʒá *summer*, pǐǯá *good*, sàgwá *bad, evil*.

Examples of ŋ, ʔ, and h in medial position: iwàŋá *my younger brother*, wàhá *grass*, pǐhí *rotten*, mǐʔí *it is said*.

3.2. All consonants are non-syllabics, but not all non-syllabics are consonants. A Bannack consonant may be defined as a non-syllabic which is capable of both initial and medial positions, and including any non-syllabic phoneme that occurs only medially but has an homorganic correspondent amongst phonemes that occur initially. Distinguished from consonants thus defined are

the non-syllabics /ŋ, ʔ, h/ which occur medially without corresponding homorganic initial consonants. By adopting this terminology we can say that there are no consonant clusters in Bannack.

We now make an additional distinction between the six consonants which are always plosive in a medial position (namely /p, t, k, c, č, kw/) and the remaining non-syllabic which is also plosive (namely /ʔ/): features that distinguish each one of these consonants are features of the same segment, but glottal stop is movable within a syllable. It may be rearticulated, or it may move to a following consonant over a syllable boundary as glottalization of this consonant. In uʔìgó· *his tongue* the glottal phoneme can be heard twice, uʔuìgó·; in čàʔá *here* it may be lost for the compensation of glottalization of a following consonant, [ǯàá̰·i] *he is here.*

3.3. Initially, any consonant that may be plosive (i.e. p, t, k, c, č, kw) is heard sometimes as a voiceless, sometimes as a voiced stop, but there is no clear-cut difference between allophones of these two types. Such a consonant may also be heard as a voiced spirant in initial position, but there are various degrees of spirantization in the same consonant in identical environments. Although such a consonant in initial position most often is heard as a voiceless lenis stop, it tends to merge with the following vowel in transitional degrees of voicing and spirantization: [p → b → β]. The phonetic records vary towards rather general approximations of what has been heard: [pía, bía, βiá] *female*, [ciáβʊi̯, ʐ̑ɬabʊ̀ɪ, ziáβʊi̯] *rose-berries*, etc.

The allophones noted above are actualized phonemically as one series in initial position; medially, the same allophones together with certain other allophones that occur only medially are so distributed as to constitute two phonemic series, which we distinguish below as C_1 versus C_2.

C_1 is a voiceless long and fortis stop in free variation with a glottalized long and fortis stop, e.g. [màk·á] ~ [màk̰·á] *to feed.*[2] As positional variants, which vary freely among each other, glottalized or nonglottalized long voiceless stops and fortis voiced stops occur with high vowels, e.g. [hìp·ɪʊ] ~ [hìp̰·ɪʊ] ~ [hib̰·ɪʊ] *to take a drink*; [ʊ̀k̰·ʊ̀má] ~ [ʊ̀g·ʊ̀má] *her husband.* In complementary distribution, namely in prefinal position before a final whispered vowel, aspirated voiceless long and fortis stops occur, e.g. [kójp̰·a] ~ [kójp·ʻA] *male mountain-sheep.*

C_2 is a voiced spirant in free variation with lenis voiced stop of varying length, or, rather, there is no clearly heard difference between allophones in the dimensions of voicing or spirantization, nor is there any clearly heard contrast in degrees of moderately varying length: [pàγá] ~ [pàgá] ~ [pàg·á] *arrow*; [hìβɪ] ~ [hìbɪ] ~ [hìb·ɪ] *to drink*; [i̯γʊ̀má] ~ [i̯gʊ̀má] *my husband.* In prefinal position before an unvoiced vowel voiceless spirants occur: [ka̰i̯βa] ~ [ka̰i̯ɸA] *mountain.*

The phonetic difference always present in a medial position between any C_1 as against any C_2 is fortis vigour and a strongly pronounced length for the former. Thus, C_1 may be termed a 'heavy consonant', distinct from C_2 as a 'light consonant'. In initial position this contrast is neutralized for all consonants in both medial series. This neutralization may be represented as:

$$C_1 < \frac{C_1}{C_2}$$

Since C_1 in medial position has the freely varying allophones p· and ʔp, the neutralization might better be represented as:

$$C < \frac{ʔC}{C}.$$

[2] For minimal contrast of C_1 and C_2, compare màká *to feed* and màgá *sharp.*

For practical transcription this is irrelevant; we write:

Initially C_1 /p,t,k,c,č,kw/
Medially C_1 /p,t,k,c,č,kw/
Medially C_2 /b,d,g,ʒ,ǯ,gw/

Bannack makes a thorough morphophonemic use of this phonemic contrast. Thus, every morpheme has a given direction which requires that a following consonant of the sort discussed is either always a heavy or always a light, unless the following consonant is the initial phoneme of a suffix that withstands this alternation. There are, namely, a number of suffixes that begin either in C_1 or in C_2 regardless of which direction a preceding morpheme may have.[3]

3.4. As shown above, the glottal plosive is distinctive in intervocalic position. The presence or the absence of glottal stop in terminal position and in sequence V?C is phonemically irrelevant: [ʔàc·á] ∼ [àc·á] *red*, [ʔɔhó] ∼ [ɔhó] *bone*; [mʊ̀hú?U] ∼ [mʊ̀hú] *owl*, [ʂàɽî·?È] ∼ [ʂàɽî·] *dog*. A final, optional glottal stop is always followed by echo-vowel.

As shown above, aspiration is distinctive in intervocalic position. Aspiration occurs as a non-distinctive feature in the following positions: (1) initially before a vowel, (2) medially after a vowel before C_1, (3) medially after C_1 before an unvoiced final vowel, (4) finally as compensation for dropped /·/ or as compensation for a dropped final vowel:

[3] We may here anticipate a problem in morphophonemics which requires for its definition a phonemic sequence which may be written V±/·/+ʔ/C_1 and be called a checked vowel phoneme. This means that the vowel in the sequence may be either long or short, but it must be followed by either glottal stop or C_1.

(1) [hìwá·] ∼ [ɬwá·] *many*, [hóʊk̓·á·] ∼ [ɔ́ʊk̓·à·] *he there*;

(2) [mɛ̀ɽé·'k·wɪ́] *he told them*, [ʊ̀ɽé·k·wi] *he told him*; [nàmɪ́ˣk̓·wá] ∼ [nàmík̓·wá] *together*;

(3) [ʊ̀p̓·àɣáp·'È] *his arrows*, [ʈɛ̀·ɳík·'WÈ] *to sing*;

(4) [únɪ́k̓·ʊ̀·] ∼ [ʊ́nɪ́k̓·u'] *in that manner*; [ɔ́uɳɔu] ∼ [ɔ́uɳɔ'] *there for a certain time*.

The employment of phonemic glottal stop and the presence or absence of the free non-distinctive glottal stop and not-glottal stop can then be tabulated as follows:

Initially: ⋕V = [⋕V] ∼ [⋕?V]
Medially: $V\pm/\cdot/+/?/\pm C+V = \left[\frac{?}{V\pm/\cdot/\pm C+V}\right]$
or
$V_1+V_2+/?/\pm C+V = \left[\frac{?}{V_1V_2\pm C+V}\right]$
Finally: V⋕ = [V⋕] ∼ [V? + echo-vowel + ⋕].

Likewise, the distribution of /h/ and of the free non-distinctive h and not-h is the following:

Initially: ⋕V = [⋕V] ∼ [⋕hV]
Medially: (1) V/h/V = [VhV]
(2) VC_1V = [VC_1V] ∼ [VhC_1V]
(3) VC_1V⋕ = [VC_1V⋕] ∼ [VC_1hV⋕], the final vowel in the last sequence being unvoiced.
Finally: (1) V·⋕ = [V·⋕] ∼ [Vh⋕]
(2) V_1V_2⋕ = [V_1V_2⋕] ∼ [V_1h⋕].

For unknown reason there is, so far, no case found of ⋕V = [⋕V] ∼ [⋕?V] ∼ [⋕hV].

PATTERNS OF TONE SUBSTITUTION IN ZAPOTEC MORPHOLOGY

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0. Objectives of past and present paper
1. Class X Stems
2. Class Y Stems
3. Class Z Stems
4. Suffix Tone Changes

0. Jaime de Angulo in an article written in 1926 tells of some of the difficulties tone presents in the morphology of Zapotec. In addition he says, "I have not been able to do more than merely to break ground in the analysis of tone in the languages of this group."[1] Again in 1935 Jaime de Angulo and L. S. Freeland discuss the difficulty of tone in morphology. They say, "But when tone is used as a grammatical process the analysis becomes very difficult for it becomes necessary to determine which is the fundamental tone and which is the variation."[2]

Paul Radin says, concerning the vowels of Tehuantepec Zapotec, "They have either a middle [a], a high [á] or a low [à] pitch."[3] In 1946 he says, "I have published two preliminary papers on Zapotec grammar specifically, The Distribution and Phonetics of the Zapotec Dialects, JSAP 17.27–76 (1925); A Preliminary Sketch of the Zapotec Language, Lg. 6.64–85 (1930). The first article is unfortunately full of typographical errors and should be used with the greatest caution at best and the second has been corrected in a later work."[4] These articles do not attempt to describe the tonomechanical changes in the Zapotec system.

[1] Jaime de Angulo, The Development of Affixes in a Group of Monosyllabic Languages of Oaxaca, Lg. 2.46–61 (1926).

[2] Jaime de Angulo and L. S. Freeland, The Zapotekan Linguistic Group, IJAL 8.1–38 (1935).

[3] Paul Radin, A Preliminary Sketch of the Zapotec Language, Lg. 6.64–85 (1930).

[4] Paul Radin, Zapotec Texts: Dialect of Juchitan-Tehuano, IJAL 12.152–72 (1946).

Morris Swadesh has recently published an article[5] in which he attempts a preliminary reconstruction of the Proto-Zapotec phonemes. His tone analysis is based on data from only two dialects, and is admittedly not of definitive nature; nor does it concern Zapotec tone morphology.

So far the only detailed study of the tone system of a Zapotec dialect is that given by Eunice V. Pike in Problems in Zapotec Tone Analysis, IJAL 14.161–70 (1948) which concerns the same dialect as that treated in this article. Eunice Pike, however, does not go into detail on the tone morphology.

This present paper describes substitutions of tone conditioned by certain affixes in certain[6] nouns[7] and verbs in Villa Alta Zapotec.[8]

[5] Morris Swadesh, The Phonemic Structure of Proto-Zapotec, IJAL 13.220–30 (1947).

[6] Since an exhaustive study of the tone substitution in Zapotec morphology was not possible at the moment, this discussion is limited to words of monosyllabic stems and stems of the form CVCĭ and CCVCĭ. Verb stems of these types have been found in actual count in text to be twice as frequent as polysyllabic ones.

[7] This dialect has nouns, verbs, particles, and attributives. Verbs are characterized by certain affixes such as tense prefixes; nouns by certain other affixes such as the possessive prefix. The suffixes discussed in this article appear with both nouns and verbs.

[8] This tonal material was gathered by the author in a field trip to the Villa Alta dialect of the Zapotec region of southern Mexico (State of Oaxaca) in 1947, under the auspices of the Summer Institute of Linguistics, Glendale, California. Other phases of the material represent research of earlier analysis in the same village. The informants used in this work were Praxedes Guzmán and Venancia Guzmán of Yatzachi el Bajo, both about 22 or 23 years of age. Other informants were used for short periods of time, but their work was usually rechecked with one of these two.

The stems of the nouns[9] and verbs[10] discussed here fall into three general classes on the basis of their tonemes and patterns of tone substitution. These classes are designated X, Y, Z.

1. Stems of class X are those with tone 3 which change to tone 2 preceding a pronominal suffix of tone 2 and remain tone 3 preceding a pronominal suffix of tone 3 (but not the first person pronominal suffix -a³ʔ *I, my* of tone 3). (A raised number after a vowel marks its tone: ¹=high, ²=mid, ³=low). These stems are all monosyllabic. The following stems belong to this class: ye³n *neck*;[11] ze³ž *fibre*; lo³z *beard*; Le³y *tooth*; na³g *ear*; leʔe³N *dish*; go³t *died*; ja³k *is able*; go³k *was able*; ja³z *plant*; go³z *planted*; ja³kʷ *dress oneself*; go³k *dressed oneself*; ǰLe³n *hold*; gʷLe³n *held*; lba³ʔ *throat*; zna³ʔ *mother*.

1.1. The pronominal suffixes with tone 2 are: -boʔ² *he* (familiar); -eʔ² *he* (respectful); -jo² *we* (inclusive); -le² *you* (plural). When these are added to stems of class X, the tone of the stem vowel changes to tone 2 by assimilation to that of the suffix vowel. The following examples are based on the stems na³g *ear*, go³t *died*, zna³ʔ *mother*: naʔ²gboʔ² *his* (fam.) *ear*, naʔ²geʔ² *his* (resp.) *ear*, naʔ²gǰo² *our* (in.) *ears*, naʔ²gle² *your* (pl.) *ears*; goʔ²tboʔ² *he* (fam.) *died*, goʔ²teʔ² *he* (resp.) *died*, goʔ²tǰo² *we* (in.) *died*, goʔ²tle² *you* (pl.) *died*; znaʔaʔ²boʔ² *his* (fam.) *mother*[12] zneʔeʔ² *his* (resp.) *mother*,[13] znaʔaʔ²jo² *our* (in.) *mother*, znaʔaʔ²le² *your* (pl.) *mother*.

1.2. The first person singular suffix is -a³ʔ *my*. When it is added to noun stems of class X, the tone of the stem vowel changes to tone 2: ye³n *neck*, ye²na³ʔ *my neck*; ze³ž *fibre*, ze²ža³ʔ *my fibre*; lo³z *beard*, lo²za²ʔ *my beard*; Le³y *tooth*, Le²ya²ʔ *my tooth*; na³g *ear*, na²ga³ʔ *my ear*; leʔe³N *dish*, leʔe²Na²ʔ *my dish*; zna³ʔ *mother*, znaʔa²⁻³ *my mother*;[14] lba³ʔ *throat*, lbaʔa²⁻³ *my throat*.

Verb stems of class X fall into three subclasses, X_a, X_b, X_c, based on the action of their stem vowel tone preceding the first person suffix -a³.

When -a³ʔ *I* is added to verb stems of class X_a the tone of the stem vowel remains tone 3: go³t *died*, go³taʔ³ *I died*; ja³k *be able*, ja³ka³ ʔ *I am able*; go³k *was able*, go³kaʔ³ *I was able*.

When -a³ʔ is added to verb stems of class X_b the tone of the stem vowel changes to tone 1: ja³z *plant*, ja¹zaʔ² *I plant*; go³z *planted*, go¹zaʔ² *I planted*; ja³kʷ *dress oneself*, ja¹kʷaʔ² *I am dressing myself*; go³k *dressed oneself*, go¹kʷaʔ² *I dressed myself*.

When -a³ʔ *I* is added to verb stems of class X_c, the tone of the stem vowel changes to a sequence of tone 1 and tone 2: ǰLe³n *hold*, ǰLe¹⁻²naʔ³ *I am holding*; gʷLe³n *held*, gʷLe¹⁻²naʔ³ *I held*.

[9] Certain nouns have two stem alternates, an unpossessed alternate (appearing without possessional suffixes) and a possessed alternate (which may appear with possessional suffixes). Certain other nouns have only the possessed stem alternate. In this article only the possessed alternates are considered.

[10] Each verb has three stem alternates. These three alternates occur in the present, past, and future tense-aspects respectively. For each verb the tone of the three stem alternates, often differing, will be considered.

[11] The consonant phonemes of Villa Alta Zapotec are: voiceless fortis, p, t, č, k, kʷ, s, š, ş, y; voiced fortis M, N, L; lenis b, d, j, g, gʷ, r, rʷ, z, ž, ẓ, n, l (fluctuating to voiceless lenis); glottal stop ʔ (which does not pattern as lenis or fortis). The following additional consonants occur in borrowed words: f, jʷ, j, r, r̃ (trilled). The vowel phonemes are: i, e, a, ɪ (high back unrounded), o. There are three tonemes: high (¹), mid (²), and low (³). Any two of these may appear as a glide on a single vowel (e.g., ²⁻³).

[12] When a morpheme ending in Vʔ precedes a morpheme beginning with a consonant, the vowel is reduplicated after the ʔ or the ʔ is dropped: Vʔ + C > VʔVC or VC. The changes in this and in the subsequent footnotes are in accordance with regular morphophonemic changes in the language.

[13] aʔ + e(ʔ) > eʔe.

[14] V_1ʔ + V_1ʔ > V_1ʔV_1.

2. Stems of class Y are those whose tone changes only with the addition of the first person singular suffix -a³ʔ *I*.

2.1. Class Y stems may be further subclassified on the basis of their lexical tones. Examples of each sub-class are first shown both in free form and with a suffix of tone 2 and a suffix of tone 3, excluding the morpheme -a³ʔ; illustrations of the latter occur in **2.2.**

2.1.1. The class Y stem may be monosyllabic with the following tones:

With tone 3 as the tone of the stem. Examples are: ẓsa³ *bean*, ẓsa³bo²ʔ *his* (fam.) *bean*, ẓsa²to³ʔ *our* (exclusive) *bean*; ǰyi³b *be washing*, ǰyi³be²ʔ *she* (resp.) *is washing*, ǰyi³bï³b *it* (animate) *is washing*; ǰgʷa³ʔ *load*, ǰgʷeʔe³⁻² *he* (resp.) *loads*, ǰgʷaʔa³to³ʔ *we* (ex.) *load*.

With tone 1 or a sequence of tone 1 + tone 2 as the tone of the stem. Tone 1 occurs on a stem vowel followed by a voiceless fortis consonant or ṛ. A sequence of tone 1 + tone 2 occurs on a vowel followed by a lenis or a voiced fortis consonant or y. Note that y and ṛ may follow either tone or a sequence of tone 1 + tone 2. Examples are: ga¹t *will die*, ga¹tǰo² *we* (in.) *will die*, ga¹to³ʔ *you* (singular) *will die*; čï¹⁻²b *will wash*, čï¹⁻²ble² *you* (pl.) *will wash*, čï¹⁻²bto³ʔ *we* (ex.) *will wash*; yi¹čṛ *head*, yi¹čṛe²ʔ *his* (resp.) *head*, yi¹čṛe³n *its* (inanimate) *head*; ẓe¹⁻²l *sandal*, ẓe¹⁻²lbo²ʔ *his* (fam.) *sandal*, ẓe¹⁻²lo³ʔ *your* (sg.) *sandal*.

With a sequence of tone 2 + tone 3 as the tone of the stem. The stem with this tone has a disyllabic alternate with tone 1 on the first vowel but tone 3 on the succeeding noncontiguous vowel or vowel cluster with glottal stop.[15] Examples: gʷze²⁻³y ~ ï¹gʷze³y *will burn*, gʷze²⁻³yle² ~ ʔï¹gʷze³yle² *you* (pl.) *will burn*, gʷze²⁻³yto³ʔ ~ ʔï¹gʷze³yto³ʔ *we* (ex.) *will burn*; Lɛʔi²⁻³ ~ ʔï¹Lɛʔi³ *will smell*, Lɛʔi²⁻³to³ʔ ~ ʔï¹Lɛʔi³to³ʔ *we* (ex.) *will smell*, Lɛʔi²⁻³ne²ʔ ~ ʔï¹Lɛʔi³ne²ʔ *he* (resp.) *will smell*.[16]

With tone 2 as the tone of the stem. Examples: ǰyi²n *is hitting*, ǰyi²nto³ʔ *we* (ex.) *are hitting*, ǰyi²nǰo² *we* (in.) *are hitting*; yoʔo² *be inside*, yoʔo²ǰo² *we* (in.) *are inside*, yoʔo²⁻³b *it* (an.) *is inside*;[17] lčo²ʔ *chest*, lčoeʔe²⁻³n *its* (inan.) *chest*,[18] lčoʔo²le² *your* (pl.) *chests*.

2.1.2. The class Y stem may be dissyllabic with the following tones:

Tone 1 or a sequence of tone 1 + tone 2 may be the tone of the first vowel and tone 2 the tone of the second vowel; the tone of the first vowel is subject to the conditioning mentioned in the second paragraph of section **2.1.1.** Examples: na¹kï² *is*, [19] na¹kle² *you* (pl.) *are*, na¹ke³n *it* (inan.) *is*; čï¹⁻²Nï² *will comb*, čï¹⁻²Nbo²ʔ *she* (fam.) *will comb*, čï¹⁻²No³ʔ *you* (sg.) *will comb*.

Tone 2 may be the tone on both vowels. Examples: ga²kï² *will be able*, ga²kbo²ʔ *he* (fam.) *will be able*, ga²ke²⁻³n *it* (inan.) *will be able*.

2.2. When the first person singular pronominal suffix -a³ʔ *I, my* is added to class Y stems, the tone of the stem vowel varies according to arbitrary subclasses which are nonpredictable and must be listed. These subclasses are designated Y_a, Y_b, Y_c, Y_d.

When the first person singular suffix -a³ʔ is added to class Y_a stems, the tone of the stem vowel remains the same. Examples: ǰža³g *meet*, ǰža³gaʔ *I meet*; ǰyi²n *is hitting*, ǰyi²naʔ *I am hitting*; ga²kï² *will be able*, ga²kaʔ *I will be able*; ga¹t *will die*, ga¹taʔ *I will die*; ga¹pï² *will care for*, ga¹paʔ *I will*

[15] Precisely for this reason we choose to write the close-knit nuclear groups of V?V and VV?V with the tones after the last vowel. This treatment of V?V and VV?V as monosyllabic is based on segmental phoneme analysis.

[16] Verb stems which end in e?i form the first person singular by suffixing -da³. The third person respectful is formed by suffixing -ne³ʔ.

[17] ï adjacent to any other vowel is lost.

[18] o? + e(?) > oe?e.

[19] When the suffix -to³ʔ first person plural exclusive is added to a stem of the form CVCï or CCVCï, the tone of the ï changes to tone 1. When any other pronominal suffix is added to a stem of the form CVCï or CCVCï, the ï is lost.

care for; bzo$^{1\text{-}2}$ꞇ *wrote*, bzo$^{1\text{-}2}$ꞇa^{3}? *I wrote*; g^{w}ze$^{2\text{-}3}$y ~ ?ï^{1}g^{w}ze^{3}y *will burn*, g^{w}ze$^{2\text{-}3}$ya^{3}? ~ ?ï^{1}g^{w}ze^{3}ya^{3}? *I will burn*; ǰNe^{3} *is speaking*, ǰnia^{3}? *I am speaking*;[20] ǰLa?a^{2} *is dividing*, ǰLa?a^{2} *I am dividing*;[21] ẓe^{1}tꞇ *sugar cane*, ẓe^{1}tꞇa^{3}? *my sugar cane*; ẓša^{1}? *cooking vessel*, ẓša?a$^{1\text{-}2}$ *my cooking vessel*.

When the first person singular suffix -a^{3}? is added to class Y$_{b}$ stems, the tone of the stem vowel changes to tone 2: g^{w}La?a^{3} *broke*, g^{w}La?a^{2} *I broke*; ẓsa^{3} *bean*, ẓsa^{2}? *my bean*.[22]

When the first person singular suffix -a^{3}? is added to class Y$_{c}$ stems, the tone of the stem vowel changes to a sequence of tone 1 + tone 2. Examples: g^{w}di^{3}l *watered*, g^{w}di$^{1\text{-}2}$la^{3}? *I watered*; g^{w}di^{2}n *hit*, g^{w}di$^{1\text{-}2}$na^{2}? *I hit*; g^{w}di^{2}nï^{2} *combed*, g^{w}di$^{1\text{-}2}$Na^{2}? *I combed*; čo$^{2\text{-}3}$g *will cut*, čo$^{1\text{-}2}$ga^{3}? *I will cut*; ẓpe^{3}b *garbage*, ẓpe$^{1\text{-}2}$ba^{3}? *my garbage*; ẓLɔ?e^{3}ꞇ *corral*, ẓLe?e$^{1\text{-}2}$ꞇa^{3}? *my corral*.

When the first person singular suffix -a^{3}? is added to class Y$_{d}$ stems, the tone of the stem vowel changes to tone 1. Examples: ǰče^{3}č *pound*, ǰče^{1}ča^{3}? *I pound*; ǰzi^{3}? *buy*, ǰzi?a$^{1\text{-}2}$ *I buy*;[23] go^{2}pï^{2} *cared for*, go^{1}pa^{2}? *I cared for*; za^{3}n *brother of female*, za^{1}na^{3}? *my brother*; ẓi$^{1\text{-}2}$b *knee*, ẓi^{1}ba^{3}? *my knee*.

2.3. Stems whose tone changes with the addition of the first person singular suffix -a^{3}? as in class Y and which have certain additional tone changes before other suffixes are assigned to a separate but related class designated YY.

2.3.1. The class YY stem is monosyllabic. It has the following tonal action:

2.3.1.1. A sequence of tone 2 + tone 3 may be the tone of the stem when the stem ends in a vowel, or a sequence of tone 1 + tone 2 may be the tone of the stem when the stem ends in V?V or Vn?. When the personal pronominal suffixes which begin with a vowel (but not the first person singular suffix) are added to the stems, the second tone of the tone sequence on the stem vowel or vowels is dropped. Examples: ǰo?a$^{1\text{-}2}$ *mouth*, ǰo?o$^{1\text{-}3}$ *your* (sg.) *mouth*;[24] ǰsi$^{1\text{-}2}$n? *be wise*, ǰsi^{1}ne?e^{2} *he* (resp.) *is wise*;[25] Ne$^{2\text{-}3}$ *will speak*, Ne$^{2\text{-}3}$b *it* (an.) *will speak*. Examples with consonant initial suffixes as shown in class Y above: ǰo?a$^{1\text{-}2}$ǰo^{2} *our* (in.) *mouth*; ǰsi?i$^{1\text{-}2}$nto^{3} *we* (ex.) *are wise*;[26] Ne$^{2\text{-}3}$bo^{2}? *he* (fam.) *will speak*.

2.3.1.2. A sequence of tone 1 + tone 2 may be the tone of the stem when the stem ends in Vn. When the third person animate suffix -ï^{3}b is added to it, the tone 2 of the stem vowel is dropped and tone 3 of the suffix vowel is added: či$^{1\text{-}2}$n *will hit*, či$^{1\text{-}3}$M *it* (an.) *will hit*.[27] Examples with other suffixes as shown in class Y above: či$^{1\text{-}2}$ne^{2}? *he* (resp.) *will hit*, či$^{1\text{-}2}$nle^{2} *you* (pl.) *will hit*.

2.3.1.3. Tone 2 may be the tone of the stem when the stem is a noun stem which ends in V? or V?V. When the first person plural exclusive suffix -to^{3}? is added to the stem the tone of the second stem vowel changes to tone 1. When the other personal pronominal suffixes (not the first person singular suffix) are added to the stem, the tone on the stem vowel remains tone 2. Example: na^{2}? *hand*, na?a$^{2\text{-}3}$b *its* (an.) *hand*,[28] na?a^{2}ǰo^{2} *our* (in.) *hand*, na?a$^{2\text{-}1}$to^{3}? *our* (ex.) *hands*.

2.3.1.4. Tone 1 may be the tone of the stem when the stem is a noun stem which ends in V?. When the personal pronominal suffixes which begin with a consonant are added to the stem, the tones on the stem vowels become a sequence of tone 1 + tone 2. Example: ẓčo^{1}? *cold*, ẓčo?$^{1\text{-}2}$bo^{2}? *his* (fam.) *cold*, ẓčo?o$^{1\text{-}2}$to^{3}? *our* (ex.) *cold*. Examples with vowel initial suffixes as shown in class

[20] e + a? > ia?.
[21] a?a + a? > a?a.
[22] a + a? > a?.
[23] i? + a? > i?a.
[24] o?a + o? > o?o.
[25] in? + V_1? > inV_1?V_1.
[26] in? + C > i?inC.
[27] n + ïb > Mb or M.
[28] V_1? + ïb > V_1?V_1b.

Y above: ʐčo?o$^{1-3}$ *your* (sg.) *cold*, ʐčo?$^{1-3}$ *its* (an.) *cold*.

2.3.1.5. Tone 1 may be the tone of the stem if the stem is a noun stem which ends in a vowel. When the second person singular suffix -o^{3}? is added to the stem the tone of the stem vowel becomes tone 2. Example: la^{1} *name*, lao^{2}? *your* (sg.) *name*. Examples of other suffixes as shown in class Y above: la^{1}bo^{2}? *his* (fam.) *name*, la^{1}to^{3}? *our* (ex.) *names*.

3. Class Z stems are monosyllabic noun stems ending in a consonant other than glottal stop or a consonant cluster (not including glottal stop), with tone 2 on the vowel of the stem. When any pronominal suffix is added to the stem there occurs one of two types of free alternation of the tone of the stem vowel. Stems of class Z thus fall into two subclasses Z_a, Z_b.

3.1. Stems of class Z_a show free alternation between tone 2 and tone 1 on the stem vowel when a pronominal suffix is added. Example: ʐpi^{2}z *cat*, ʐpi^{2}za^{3}? ~ ʐpi^{1}za^{3}? *my cat*.

3.2. Stems of class Z_b show free alternation between tone 1 and a sequence of tone 2 + tone 1 on the stem vowel when a pronominal suffix is added. Example: ʐʟe^{2}k^{w} *rooster*, ʐʟe$^{2-1}$k^{w}Jo^{2} ~ ʐʟe^{1}k^{w}Jo^{2} *our* (in.) *rooster*. There is one stem which has a sequence of tone 2 + tone 1 on the stem vowel which shows the same free alternation when the pronominal suffixes are added: ʐa$^{2-1}$pr̨ *chayote tree*, ʐa$^{2-1}$pr̨to^{3}? ~ ʐa^{1}pr̨to^{3}? *our* (ex.) *chayote tree*.

3.3. Stems which show free alternation as in class Z_a only when the suffixes which begin with a consonant are added to them are assigned to a separate but related subclass designated Z_{aa}. These stems are monosyllabic and end in CV with tone 2^{1} on it. When the suffixes which begin with a vowel are added to the stem, the tone of the stem vowel remains tone 2. Example: ʐg^{w}i^{2} *orange*, ʐg^{w}io^{2}? *your* (sg.) *orange*, ʐg^{w}i^{2}Jo^{2} ~ ʐg^{w}i^{1}Jo^{2} *our* (in.) *orange*.

4. When the suffixes -a^{3}? first person singular, -o^{3}? second person singular, and -e^{3}n third person singular inanimate, are added to certain stems (of all the above classes) the suffix tone changes.

When the suffix -a^{3}? is added to certain stems of class X, Y, YY, and Z (not correlated with any of the above subdivisions), the tone of the suffix vowel changes to tone 2. Examples: Class X stems, ʟe^{3}y *tooth*, ʟe^{2}ya^{2}? *my tooth*; Ja^{3}z *plant*, Ja^{1}za^{2}? *I plant*; class Y stems, še^{1}y *will burn oneself*, še^{1}ya^{2}? *I will burn myself*; Jyi^{2}n *is hitting*, Jyi^{2}na^{2}? *I am hitting*; Ja^{2}bï^{2} *is knitting*, Ja$^{1-2}$ba^{2}? *I am knitting*; Je^{3}p *is climbing*, Je^{1}pa^{2}? *I am climbing*; class YY stems, ʐa^{1} *clothes*, ʐa^{2}? *my clothes*; Ne$^{2-3}$ *will speak*, Nia$^{1-2}$? *I will speak*; class Z stem, ʐg^{w}i^{2} *orange*, zg^{w}ia^{2}? *my orange*.

When the second person singular suffix -o^{3}? is added to verb stems of tone 2 and to certain class YY noun stems and to certain class Z noun stems, the suffix tone changes to tone 2. Examples: la^{1} *name*, lao^{2}? *your* (sg.) *name*; ʐsa^{2} *lard*, ʐsao^{2}? *your* (sg.) *lard*; Jyi^{2}n *hit*, Jyi^{2}no^{2}? *you hit*.

When the third person singular inanimate suffix -e^{3} is added to certain class Y stems and to certain class YY noun stems of tone 2, the suffix tone changes to a sequence of tone 2 + tone 3. Examples: lčo^{2}? *chest*, lčoe?e$^{2-3}$n *its* (inan.) *chest*; ʐka^{2}? *basket*, ʐke?e$^{2-3}$n *its* (inan.) *basket*; Jyi^{2}n *is hitting*, Jyi^{2}ne$^{2-3}$n *it* (inan.) *is hitting*.

SOUND PATTERNS IN THREE INCA DIALECTS

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1. Introduction
2. Cuzco dialect
3. Ayacucho dialect
4. Classic Inca
5. Conclusion

1. Introduction. The Inca language, also called Quichua (with various spellings) and Runasimi, is easily the most important native American language in numbers of speakers, with close to five million as of 1940. It is spoken over a vast area of mountain and forest country between southern Colombia and northwest Argentina in an indetermined number of local dialects, the two largest of which are those of Cuzco and Ayacucho with something over 775,000 native speakers each.[1] The Inca language owes its great extent to its use as the common language of the Inca Empire (about 1438 to 1535) and to its adoption by Spanish Catholic missionaries who imposed it even on some areas which were never subject to the Empire such as Sibundoy in southern Colombia and Santiago del Estero in Argentina. Its original home seems to have been a small area in the highlands of southern Peru between Andahuaylas and Combapata and it is very doubtful if it had more than half a million speakers in 1438 when the Inca expansion started.[2]

While there were certainly dialect differences within the original Inca area,[3] there is good reason to suppose that the known modern dialects, including those of Cuzco and Ayacucho, derive from the form of the language spoken in Cuzco in the 16th century rather than preserving older local differences. The situation is analogous to that of Greek, where the modern dialects derive from the Koiné and older differences have largely been lost. The Cuzco dialect of the 16th century may be styled for convenience "Classic Inca."

Classic Inca has left us some very substantial literary monuments, of which the most important linguistically are probably the grammar and dictionary of Diego González Holguín[4] and the writings of Francisco de Avila.[5] All works in Classic Inca, however, are written in a hispanicized orthography which so completely obscures the sound patterns of the dialect that it has hitherto been almost impossible to use them for linguistic comparisons or as material for philological studies. It is my purpose to point out that a comparative study of the sound patterns of the modern Cuzco and Ayacucho dialects permits a detailed reconstruction of the sounds of Classic Inca.

A preliminary report on this work was

[1] J. H. Rowe, The Distribution of Indians and Indian Languages in Peru, Geographical Review 37.202–215 (1947), pp. 215–211 and maps.

[2] J. H. Rowe, Inca Culture at the Time of the Spanish Conquest, in Handbook of South American Indians, BAE-B 143, 2.183–300 (1946), pp. 188–190, 261 and map 3. On the map, Chanca and Cotabambas should also be shaded.

[3] See Domingo de Santo Tomás, Arte de la lengua quichua . . . publicada de nuevo por Julio Platzmann, edición facsimilar, B. F. Teubner, Leipzig (1891), f. iv.

[4] Diego González Holguín, Gramatica y arte nveva dela lengva general de todo el Peru, llamada lengua Qquichua, o lengua del Inca, Francisco del Canto, Lima (1607); same author, Vocabvlario de la lengva general de todo el Perv llamada lengua Qquichua, o del Inca. Corregido y renovado conforme ala propriedad cortesana del Cuzco, Francisco del Canto, Lima (1608).

[5] Francisco de Ávila, Tratado de los Evangelios, qve Nvestra Madre la Iglesia propone en todo el año . . . en las lenguas Castellana, y General de los Indios deste Reyno del Perú . . . , Lima, 2 vols. (1648); same author, De priscorum Huaruchiriensium origine et institutis, ed. Hipólito Galante, Consejo Superior de Investigaciones Científicas, Instituto Gonzalo Fernández de Oviedo, pub. 8, Madrid (1942). The second work was written in 1608.

published in 1943, comprising the results of a seminar in descriptive linguistics which I conducted at the University of Cuzco in that year.[6] Subsequent work has brought out so many mistakes in that analysis that I must caution the reader against using it. The same caution must be applied to the only two other attempts at a scientific treatment of the sounds of the Cuzco dialect, those by Harrington and Valcarcel and Pike.[7] Both studies, however, made certain very important observations which I have incorporated in the present treatment.

Phonetic transcriptions are made in the alphabet proposed by Bloch and Trager[8] with the following modifications: [y] is used instead of [j] for the high front semivowel; [q] for the voiceless velar stop; [j] for the voiceless velar fricative; and [r] for the single flap r. Instead of working out a strictly phonemic alphabet for each dialect I have adopted the "official" Peruvian alphabet, established by decree of the Minister of Education, October 29, 1946.[9] The result is a sort of "traditional" orthography, fairly close to that used by most present day bilinguals and about as faithful to the phonemic system of the language as traditional Spanish orthography is to the phonemes of Spanish. That means that all phonemic distinctions are provided for in some way but some phonemes are represented by two or three letters and some allophones are distinguished. Any reader desiring to make a straight phonemic transcription can do so very easily on the basis of the materials presented here.

2. Cuzco dialect. The Cuzco dialect is spoken in the whole of the Department of Cuzco, in Puno up to the limits of Aymara, in part of the Department of Arequipa, and in that part of Apurimac lying east of a north-south line drawn through Abancay This line divides it from the Ayacucho dialect and represents not a sharp frontier but a zone of transition of undetermined width. There are some local differences within this area, naturally, but the differences in sounds are probably sub-phonemic. My materials refer primarily to the city of Cuzco but have been checked with informants from Cotabambas, Curahuasi, Acomayo, Combapata, and Pucará (Puno).

Positional variants of Inca phonemes depend in part on the preceding or following sound and in part on initial, medial, or final position in the word and in the syllable. Consequently some remarks on word and syllable structure are in order. In all Inca dialects words are distinguished by formal criteria of which the most important is the stress accent. In both Cuzco and Ayacucho the primary accent falls regularly on the next to the last syllable and secondary accents mark every alternate syllable counting back from the primary accent. There are a few exceptions accented on the last syllable: (1) interjections, which are usually of three syllables; (2) words ending with the terminal suffixes -chá (uncertainty), -má *rather*, -rí *but*, -yá *therefore*; (3) the word arí *yes*. An acute accent will be used to mark the stress in all such exceptional cases.

Syllable division can be observed easily in slow pronunciations. There are only two syllable types, CV and CVC. Two consonant

[6] J. H. Rowe and Gabriel Escobar M., Los sonidos quechuas de cuzco y chanca, Waman Puma, Cuzco, 3 (no. 15).21–34 (1943).

[7] John P. Harrington and Luís E. Valcárcel, Quichua Phonetics. A Shortcut to the Scientific Writing of the Language of the Incas of Peru, Revista del Museo Nacional, Lima, 10.201–214 (1941); Kenneth L. Pike, Report to the American Bible Society, extracted and summarized in: The Orthography of Quechua of Cuzco and Bolivia (typescript, 25 pp., March, 1944). I was able to consult a copy of this ms. in the Lima office of the American Bible Society through the courtesy of John Ritchie.

[8] Bernard Bloch and George L. Trager, Outline of Linguistic Analysis, Special Publications of the Linguistic Society of America [No. 2], Baltimore (1942).

[9] Ministerio de Educación Pública (Peru), Alfabeto oficial de los idiomas aborígenes quechua y aymará (decree signed by Luís E. Valcárcel, Ministro). Typed copy in possession of J. H. R.

phonemes never occur together in the same syllable and no syllable has more than one vowel.

Pitch or tone plays no role in either of the two modern dialects with which we are concerned. Tone is not used to make phonemic distinctions and intonation is used to distinguish phrase types only by speakers under marked Spanish influence. The phrase type is properly indicated by the use of appropriate suffixes and the Spanish (and English) use of intonation sounds ludicrous to native speakers of Inca.[10]

The sounds of Cuzco Inca can be grouped into three vowel phonemes and twenty-six consonant phonemes. We will take up each in turn, identifying it with the letters used to represent it in our arbitrary "traditional" orthography.

(1) a. The phoneme a includes two positional variants: [ɛ] used before [y] and [æ] everywhere else. The tongue position for Inca a is always somewhat higher than for Spanish a. Examples: [ʔæn̪t̪æ] 'anta *copper*, [ʔæn̪t̪ɛy] 'antay *my copper*, [ʔæpɛy] 'apay *carry*, [ʔæqo] 'aqo *sand*, [ʔoqæ] 'oqa *oca*.

(2) i, e. This phoneme has a number of positional variants: [I] the commonest form; [I_v] used in final position and before [r] and [rq]; [i] used before [y]. The combination [iy] is phonetically indistinguishable from [ii] but the group is treated as if it ended in a consonant so [iy] is a preferable interpretation.[11] These three allophones are written i in the "traditional" orthography. [e] used before or after [q] and [j]; [e_{Λ}] used before [ŋq]. These two allophones are written e. Examples: [ʔIn̪t̪I_v] 'inti *sun*, [niy] niy *say*, [nInI_v] nini *I say*, [nej] neq *saying*, [t̪$^{s'}$ej̪t̪ɛy] ch'eqtay *split*, [q'en̪t̪I_v] q'enti *hummingbird*, [p$I_v$rqæ] pirqa *stone wall*, [q'omI_vr] q'omir *green*, [p'e_{Λ}ŋqɛy] p'enqay *shame*.

(3) u, o. The positional variants of this phoneme are distributed like those of i, e: [U] the commonest form; [U_v] in final position and before [r] and [rq]; [ů] before [y] except when preceded by q,—these three allophones are written u; [o] before or after [q] and [j]; [o_{Λ}] before [ŋq],—these two allophones are written o. Examples: [ʔUnU_v] 'unu *water*, [ʔUnůy] 'unuy *my water*, [kUn̪t̪U_vr] kuntur *condor*, [ʔ$U_v$rqo] 'urqo *hill, male*, [so$_{\Lambda}$ŋqo] sonqo *heart*, [ʔo$_{\Lambda}$ŋqoy] 'onqoy *sicken*.

(4) w. One sound, [w].

(5) y. One sound, [y]. These two semivowels are treated as consonants even where they follow a vowel. Consequently it simplifies the classification to say that Inca has no vowel pairs and that combinations which might be classed as vowel pairs in other languages are groups of vowel and consonant in Inca. After vowels y is much more common than w. The combinations ay, aw, iy, iw, uy occur in 'aycha *flesh*; kawsay *live*; qatiy *drive*; Siwsa (a place name in Apurimac),—the iw combination is very rare; 'uywa *beast*. The other logical possibility, uw, does not occur.

(6) h. An aspiration [h], like English h rather than like Spanish j. It occurs only in word initial position except in the two words muhu *seed* and uhuy *cough*. The letter h is also used in the "traditional" orthography to mark the aspiration of stops and affricate, a phonetically related phenomenon.

(7) '. The glottal stop [ʔ]. Like h it occurs only in word initial position (no known exceptions). Harrington was probably the first to point out that no Inca word begins with a vowel and that the words commonly written with an initial vowel begin with a glottal stop. This is certainly true. The letter ' is also used in the "traditional" orthography to mark the glottalization of stops and affricate, a phonetically related phenomenon.

(8) ch. One sound [t̪^{s}].[12] In the Cuzco dia-

[10] My field data on Inca tone patterns are insufficient for a more detailed statement in this paper.

[11] I. e., we are dealing with the second case discussed by George L. Trager, The Phonemic Treatment of Semivowels, Lg. 18.220–223 (1942), section 6, p. 223.

[12] This sound and all stops are unaspirated unless the aspiration is specifically indicated.

lect it occurs only in syllable initial position.

(9) ch'. Glottalized ch [t͡ʃˀ], a separate phoneme from ch. It occurs only in syllable initial position and only once in any given word.

(10) chh. Aspirated ch [t͡ʃʰ], same comments as for ch'.

(11) k. This phoneme has two allophones: [k] in syllable initial position and [χ] in syllable final position. Pike (Ms) assigns [χ] to the same phoneme as [h] with which it is also in complimentary distribution. This is a mistake as the case of k is clearly parallel structurally to that of q (see below and compare the situation in the Ayacucho dialect).

(12) k'. Glottalized k [k']. Same distribution as ch'.

(13) kh. Aspirated k [kʻ]. Same distribution as ch'.

(14) p. In syllable initial position, [p]. In a few examples it has a syllable final allophone [ɸ]: ch'apra [t͡ʃʰˀæɸræ] *dry branch*. The alternate form ch'aqra [t͡ʃʰˀæjræ] is more common.

(15) p'. Glottalized p [p']. Same distribution as ch'.

(16) ph. Aspirated p [pʻ]. Same distribution as ch'.

(17) q. This phoneme, like k, has two allophones: [q] in syllable initial position and [j] in syllable final position.

(18) q'. Glottalized q [q']. Same distribution as ch'.

(19) qh. Aspirated q [qʻ]. Same distribution as ch'.

(20) t. In syllable initial position, [t̪]. In a few examples it has a syllable final allophone [θ]: Q'atqa [q'æθqæ] Catca (a place name). The alternate form Q'aqqa [q'æjqæ] is more common.

(21) t'. Glottalized t [t̪']. Same distribution as ch'.

(22) th. Aspirated t [t̪ʻ]. Same distribution as ch'.

(23) r. Single apical flap, voiced: [r]. The Spanish vibrant rr and its fricative variants do not occur in the Inca dialects under consideration. r occurs in all positions.

(24) s. Inca s is not exactly like Spanish s [s]; the tongue position is slightly higher. English speaking listeners sometimes hear it as [š], especially in the group -sy- [sy] in which the high tongue position of the y raises the s still more, but its tongue position is never really as high as for [š]. s occurs in all positions.

(25) l. [l].

(26) ll. [λ_y] and [λ]. These two phonemes (25 and 26) have an interesting overlapping distribution. [l] occurs in syllable initial position: layqa *witch*; qalaywa *lizard*; in word final position: ch'unchul *guts*; in syllable final position in the interior of a word before q and t: alqo *dog*; p'alta *somewhat rounded*. [λ_y] occurs in syllable initial position: llaqta *town*; taqlla *foot plow*. [λ] occurs in syllable final position in the interior of a word before ch, k, m, p and w: wallchara *disordered*; sullk'a *younger*; k'allma *branch*; 'allpa *earth*; challwa *fish*. [l] and [λ_y] are in contrast but [λ] is in complementary distribution to both of them and could be interpreted as an allophone of either. I have grouped it with [λ_y] for convenience, to conform to current Peruvian practice.

It is worth noting that syllable initial l is very rare in the Cuzco dialect and occurs chiefly in words borrowed from Aymara or Spanish. Still, there seem to be a few native words in which it occurs also: luychu *deer*; lanlay *go to the devil*, etc.

(27) m. [m].

(28) n. [n] and [ŋ].

(29) ñ. [$ɲ_y$] These three phonemes (27–29) also have an overlapping distribution. [m] occurs in syllable initial position: munay *love*; llama *llama*; and in syllable final position in the interior of a word before p: pampa *plain*. [n] occurs in syllable initial position: nina *fire*; and in syllable final position in the interior of a word before ch and t: p'unchay *day*; t'anta *bread*. [$ɲ_y$] occurs in syllable initial position only: ñawi *eye*; wiñay *forever*. [ŋ] is

the only nasal which occurs in word final or syllable final position in the interior of a word before k, l, ll, m, ñ, q, r, s, w, y as in 'inka *Inca*; lanlay *go to the devil*; 'anllanakuy *argue*; chaskinman *he ought to receive*; sapallanña *already done*; q'enqo *zigzag*; rinri *ear*; kinsa *three*; wanwa *mosquito*; tunya (name of a plant). The situation is, then, that [m], [n] and [ɲʸ] are in contrast in the syllable initial position, and [ŋ] is in complementary distribution to all three in the syllable final one. Consequently [ŋ] could be classified with any of the three; I group it with [n] simply to conform to current Peruvian practice.

It is rather curious that [λʸ] and [ɲʸ] are the only palatalized sounds in the Inca language, and there are no labialized ones, at any rate as separate phonemes. The groups of consonants which have y or w for a second member are not cases of straight palatalization or labialization (my own report of 1943 to the contrary notwithstanding) for the two consonants in these groups belong to different syllables.

To sum up the positional functions of the various phonemes, any consonant may occur in syllable initial position, but no vowel ever occurs in this position. In word final position only the three vowel phonemes and eight of the consonant phonemes occur: a, i, u, w, y, k, l, n, q, r, s as in 'anka *eagle*, rumi *stone*; ruru *fruit*; qawqaw (name of a plant; w is very rare as a final sound); rimay *talk*; huk *one* (the fricative allophone [χ]); ch'unchul *guts*; kunan *now* (the [ŋ] allophone only); musoq *new* (the ricative allophone [j]); yawar *blood*; sipas *girl*. In syllable final position in the interior of a word certain other sounds may be found: n, m, ll, p, t as in t'anta *bread* (the [n] allophone); pampa *plain*; 'allpa *earth* (the [λ] allophone); sapsa *ragged* (the fricative allophone [ɸ]); Qatqa *Catca* (the fricative allophone [θ]). Not h nor the glottal stop nor any stop or affricate occurs in syllable final position under any circumstances in this dialect. The phonetic system as a whole is both simple and rigid: it consists of a small number of phonemes arranged in very formal patterns.

The nature of its phonetic system makes it difficult for Inca to borrow from any other language but Aymara which has rather similar phonemes. Nevertheless, it has lived so intimately with Spanish for the last four hundred years that a large number of Spanish words have been borrowed and assimilated to the Inca sound patterns, while many others are commonly used as foreign words with more or less of their Spanish pronunciation. The only phonetic influences that I have been able to trace are the reinforcing of the native l and a tendency to use [j] between vowels, probably influenced by Spanish j. The latter phenomenon may be seen in Spanish loans: awja (<aguja) *needle* and uwija (<oveja) *sheep*. [χ] also appears between vowels in the native form [mIχùy], a careless but common "mistake" for mikhuy *eat*.

3. Ayacucho dialect. The Ayacucho dialect is spoken in the whole of the Departments of Ayacucho and Huancavelica and in Apurimac up to its boundary with the Cuzco dialect. The dialect of Junín which bounds it on the north is said to be quite different, but I have never had a chance to question an informant about it. My own materials on the Ayacucho dialect refer to the cities of Ayacucho and Huanta, but I have checked them in great detail with Mr. Kenneth G. Case, author of an exhaustive and linguistically excellent study of the speech of Andahuaylas which is still in manuscript.

To avoid repetition I will emphasize the differences between the Ayacucho dialect and that of Cuzco, referring to the description already given of the latter where the Ayacucho pattern is similar.

The sounds and uses of the three vowels and the two semivowels are the same as in the Cuzco dialect. h and the glottal stop are used word initially only; Ayacucho lacks the glottalized and aspirated stops and af-

fricates of Cuzco entirely. ch, k, p and t are affricate and stops only (i. e. they lack fricative allophones) and they occur in syllable final and word final as well as syllable initial positions. q has two allophones: [q^{j}], an affricate,[13] in syllable initial position, and [j], fricative, in syllable final position. r and s follow the same rules as in Cuzco.

The same three laterals occur, but their distribution is somewhat different. [l] occurs in syllable initial position: linlis *fungus*; in word final position: chunchul *guts*; and in syllable final position in the interior of a word before t only: palta *flattened*. [λ_y] occurs in syllable initial position only: lloqlla *mudslide*. [λ] occurs only in syllable final position in the interior of a word before ch, k, m, p, q, w as in kallchay *harvest maize*; kullku *dove*; kallma *branch*; 'allpa *earth*; 'allqo *dog*; challwa *fish*. As in the Cuzco dialect, I have grouped [λ] and [λ_y] arbitrarily into the same phoneme, although [λ] is in complementary distribution with both [l] and [λ_y].

The same four nasal sounds occur in Ayacucho, but their phonemic distribution is somewhat different. [m] is a phoneme complete in itself, without overlapping the other nasals. It occurs in syllable initial and word final positions: manam *no*, and in syllable final position in the interior of a word before r, s and y as in qamrí *and thou?*, kimsa *three*, qamya *tasteless*; and probably before various other sounds of which I have no examples. [n] occurs in syllable initial position: nakay *behead*; and in syllable final position in the interior of a word before ch and t as in punchaw *day*, tanta *bread*. [n_y] occurs in syllable initial position only: puñuy *sleep*. [ŋ] occurs in word final position: kayman *to him*, and in syllable final position in the interior of a word before k, l, ll, m, n, ñ, q, r, s, w, y as in sankay (a big cactus); linlis *fungus*; lanllapakuy *yawn*; chaskinman *he would receive*; chunneq *uninhabited*; sapallanña *already alone*; sonqo *heart*; rinri *ear*; sansa *coals*; wanwa *mosquito*; tinya *small drum*. As in the Cuzco dialect, I have assigned [n] and [ŋ] to the same phoneme, although [ŋ] is also in complementary distribution with [n_y].

Of the consonants which the Cuzco dialect does not have in word final position, three occur in this position in Ayacucho: ch, m and p in tarukachuch *a deer, perhaps*; qam *thou*; runap *a man's* (stop, not fricative p). All the Cuzco word finals also occur in this dialect, but k is a stop instead of a fricative in this position. t does not occur in word final position, but it is not uncommon in syllable final position in the interior of a word where it is invariably a stop: tatkiy *interrupt*.

Apart from the differences listed above, there are some interesting consonant alternations between the two dialects: (Cuzco forms precede Ayacucho) 'askha, 'achka *enough*; thaskiy, tatkiy *pace, interrupt*; k'iski, kichki *constipated*; tarukachus, tarukachuch *a deer, perhaps*; yachankichis, yachankichik *ye shall know*; runaq, runap *a man's*; manan, manam *no*. These lists could be made as long as desired. The important thing to note about them is that, aside from the last example which shows Cuzco -n beside Ayacucho -m, all the rest show Cuzco fricatives beside Ayacucho stops in syllable final position, and Cuzco aspirated and glottalized stops beside Ayacucho simple stops in syllable initial position. We will have occasion to analyze these differences in our discussion of the sounds of Classic Inca.

4. Classic Inca. The first printed work in Inca is the grammar and dictionary of Domingo de Santo Tomás (1560), but it is not at all certain that the dialect he describes is the Classic Inca of Cuzco. He does not state to what area his description refers, but it is quite possibly part of what is now Apurimac, since he calls the language Quichua, the name of a tribe in that area. Because of the differences between the dialect described by Santo Tomás and that

[13] This usage is an extension of my use of [j] as a velar fricative instead of as a semivowel. The symbol should not be read as palatalized [q].

described by the writers who specify that they are describing the court language of Cuzco I have not relied on Santo Tomás for the purposes of this study. I have taken as the standard for Classic Inca the grammar (1607) and dictionary (1608) of Diego González Holguín, S. J., which he says represent twenty five years' study of the court dialect of Cuczo.[14] I have also used the linguistic testimony of "The Inca" Garcilaso de la Vega,[15] though more cautiously as he can be very unreliable. His description refers to the period 1540–1560. A somewhat later writer, Francisco de Avila, uses substantially the same dialect.[16] Finally, I have used the Confesionario and Catechism published by the Third Provincial Council of Lima in 1585, the Inca texts in which are the work of a committee of Jesuit fathers directed by José de Acosta.[17]

With so much early written material, our problem is to interpret the hispanicized orthography in which it is written in the light of the modern dialects rather than to attempt straight comparative reconstructions with the modern material alone. The situation is complicated by the fact that our documents refer to a period when Spanish was just finishing a great sound shift and the pronunciation of several Spanish letters is uncertain. This factor affects chiefly the interpretation of Inca s.

There is little doubt that the pattern of vowel sounds which we have found to be identical in modern Cuzco and Ayacucho was also present in the Classic dialect. The texts use all five Spanish vowel letters, and i, e and o, u appear in the same complementary positions as in our "traditional" orthography. We may say, then, that the Classic dialect had three vowel phonemes whose allophones were distributed in the same positions as in the modern Cuzco dialect.

w and y were evidently used in the same way in Classic Inca as in the modern dialects. The sound [y] was usually represented by the letter y in the texts, but occasionally by i. j was commonly used for the second member of the group iy as in contemporary Latin texts. In a few cases where the y is intervocalic and the preceding letter is i, e the y was not written at all: ttiu (i. e. t'iyu) *sand.* If there is any doubt about interpreting these cases, the modern dialects provide the key. It should be noted that, in accordance with Spanish practice, y was written for initial i in cases where it is clearly syllabic: Ynca (i.e. 'inka) *Inca.*

w was written most commonly hu or gu, but often v when word initial, following Spanish conventions, and sometimes u in any position. As in the case of y, w is sometimes omitted entirely when it is intervocalic and preceded by u, o: quinua (i.e. kinuwa) *quinoa.* w was somewhat more common in syllable final position in Classic Inca than in the modern dialects: Cuzco especially has nearly eliminated it in that position, as in the common words *day* and *brother* which are p'unchaw and wawqe in Classic Inca, p'unchay and wayqe in Cuzco. In both these cases the w is preserved in the Ayacucho dialect.

h is written word initial often and intervocalic in the words muhu *seed,* uhu *cough,* and mahiy *be bored with one's spouse.* González Holguín states clearly that h is "the ordinary aspiration" (Vocabvlario, f. 1), that is, the sound which appears in both modern dialects and which Spanish had until the 16th century and has since lost.

The glottal stop is not written or described in any of the texts, but the fact that it is used in both modern dialects and that glottalized consonants existed in the Classic dia-

[14] See footnote 4.

[15] Garcilaso de la Vega, "El Inca", Comentarios reales de los Incas, ed. Ángel Rosenblat, Emecé Editores, Buenos Aires, 2 vols. (2nd ed., 1945). The work was first published in 1607.

[16] See footnote 5.

[17] Tercer Concilio Provincial, Confessionario para los Cvras de indios. . . . Compvesto y tradvzido enlas Lenguas Quichua, y Aymara . . . , Antonio Ricardo, Lima (1585), and Tercero Cathecismo y exposicion de la Doctrina Christiana, por Sermones . . . (same publisher and date).

lect (see below) leads me to restore it in the same distribution it has in modern Cuzco.

The stops k, p, t and the affricate ch occur in syllable initial position in both modern dialects, and the texts indicate that they did so also in Classic Inca. The velar sound q is distinguished from k by being written cc/qqu instead of c/qu (González Holguín and Avila) and in contrasting examples by Garcilaso (Part 1, bk. ii, ch. 5 and bk. iii, ch. 25). It is almost certain for reasons of pattern that this sound was the stop of Cuzco and not the affricate of Ayacucho in syllable initial position.[18]

There is no doubt that these five sounds also had aspirated and glottalized forms exactly as in the modern Cuzco dialect, although no old text uses spellings which distinguish them systematically. Garcilaso says: "[Inca] has three different ways of pronouncing certain syllables, very different from the way they are pronounced in the Spanish language, and on these[d] ronunciations depend differences of meaning in a word otherwise the same: some syllables are pronounced with the lips, others in the palate, and others down in the throat." (1945 edition, vol. 1, p. 9).[19] This is a typically ambiguous comment which may refer in part to the difference between simple, aspirated and glottalized stops. In his examples, Garcilaso contrasts aca *dung* (Cuzco: 'aqa) and aca *chicha* (Cuzco: 'aqha) (Pt. I, bk. iv, ch. 3). González Holguín writes with simple p, t and ch words which also have simple sounds in modern Cuzco; words that have aspirated or glottalized sounds in modern Cuzco he writes usually with double letters: pp, tt and chh. Words with k in modern Cuczo are written with c/qu, but words with k', kh, q, q', q^h are written with either cc/qqu or k in a most inconsistent manner. Avila uses the same conventions as González Holguín except that he does not use the letter k. Garcilaso and the Third Council write only c/qu, p, t and ch for all fifteen of these phonemes, but, as we have seen, Garcilaso distinguishes several of them in his examples. I conclude that a word which has syllable initial k, q, p, t or ch, simple, aspirated or glottalized, in the modern Cuzco dialect, had the same sound in the same position in Classic Inca.

The pronunciation of k, q, p, t and ch in syllable final position is a more complex problem. It will be remembered that the Ayacucho dialect has all five of these phonemes in syllable final position, and only q is fricative. The Cuzco dialect on the other hand, has only fricative allophones of k, q, p and t in this position and does not have ch. Examination of a long series of parallel examples permits the following observations:

(1) In most cases where Ayacucho has stop -k, Cuzco has fricative -k (exceptionally -s).

(2) In all cases where Ayacucho has -q, Cuzco has fricative -q.

(3) Where Ayacucho has the stops -p and -t, Cuzco has -s or fricative -q and in rare cases fricative allophones of -p and -t.

(4) Where Ayacucho has -ch Cuzco has -s.

As usual, the interpretation of the orthography of the Classic Inca documents is not easy; for example, syllable final -k and syllable final -q can be distinguished by the preceding vowel when it is e, i, o or u and these consonants occur in the same words in which they are found in the Ayacucho dialect (due exception being taken for statement 3 above). However, we have no assurance that the old orthography would have distinguished between stop and fricative allophones of these phonemes if they existed, so their exact pronunciation is obscure.

The same is true of -t, which likewise occurs in the same words as in Ayacucho. With -p, however, we are on firmer ground, for it seems likely that a fricative -p would have been written -f. Consequently, when

[18] The pattern referred to is the pattern of the modern Cuzco sounds, the other characteristics of which (glottalization and aspiration) were present, as indicated in the following paragraph.

[19] See footnote 15.

we find -p in Classic Inca in the same words in which it occurs in Ayacucho we are quite safe in supposing that stop -p is meant. -ch also occurs in Classic Inca in the same words as in Ayacucho and can be presumed to have the same pronunciation. A few examples follow:

Cuzco	*Ayacucho*	*Classic*[20]	
'akllay	'akllay	acllay	*choose*
huk	huk	huc	*one*
llaqta	llaqta	llacta	*town*
musoq	musoq	mussoc	*new*
'uskhu	'utku	utcu	*cotton*
thaskiy	tatkiy	tatquiy	*pace*
runaq	runap	runap	*a man's*
raqra	rapra	rapra	*branch*
-qti-	-pti-	-pti-	*when*
'askha	'achka	achca	*enough*
puska	puchka	puchca	*spindle*
maypis	maypich	maypich	*where I don't know*

In two of the five cases under consideration (p and ch) Classic agrees with Ayacucho, and one of these cases (p) establishes the existence of syllable final stops in the Classic dialect. It seems to me that there is only one possible hypothesis which explains adequately the modern forms of the three other sounds and the spellings in the documents. It may be stated as follows: Classic Inca had a full set of stops (k, q, p, t) and affricate (ch) in the syllable final position, and these have all been changed to fricatives at some stage in the formation of the modern Cuzco dialect. I have included q in spite of the fact that it is fricative in Ayacucho; this is done for reasons of symmetry and I think the reader will agree that its inclusion is extremely plausible. On this hypothesis the presence of syllable final k, q, p, t and ch in the Classic dialect can be deduced for a given word either from its form in Ayacucho or, in some cases, from the written form in the Classic texts.

Of course, many words which have syllable final fricatives in modern Cuzco had them also in Classic Inca and have them in Ayacucho. What happened is that, through the operation of a regular phonetic change, the older syllable final stops and affricate have fallen together with the syllable final fricatives in some cases and some new fricatives have been created in others.

The date of this sound shift can be fixed fairly exactly any time we have a good series of dated colonial manuscripts for the Cuzco dialect area. Even with our present limited material, however, it is possible to fix it approximately. The full classic forms are used in Avila's sermons of 1648 while the oldest manuscripts of the play Ollantay, plausibly dated shortly before 1780[21] have the modern forms. This period was, incidentally, the Inca literary "dark age" when the language was very rarely written.

Modern Cuzco and Ayacucho both have the same single flap r and Garcilaso (1945 edition, vol. 1, p. 9) and González Holguín (Vocabvlario, f. 1 recto) both certify that it was pronounced the same way in Classic Inca and that the language had no sound like Spanish rr.

No Inca sound presents such a thorny problem as s, in spite of the fact that both modern dialects have only one s sound. The trouble is that the Classic documents write modern s in four different ways: s, ss, ç and z, and these letters formerly had different sounds in Spanish. The history of the Spanish sounds is summarized by Menéndez Pidal.[22] In the 15th century, Spanish made the following distinctions: s intervocalic [z], s elsewhere [s], ss intervocalic [s], ç (and c before e and i) [t̪ˢ], z [d̪ˢ], x [š], j (and g before e and i) [ž]. Confusion between these sounds becomes evident in the documents early in the 16th century. In the course of about a hundred years the six sounds were reduced to three in Spain and two in America through stages about which we know very little. According to Menéndez Pidal the older

[20] González Holguín's spellings.

[21] See Ricardo Rojas, Un titán de los Andes, Colección Azul y Blanco, no. 2, Editorial Losada, Buenos Aires (1939).

[22] Ramón Menéndez Pidal, Manual de gramática histórica española, Espasa-Calpe, Madrid (7th edition, 1944), section 35 bis.

distinctions had been generally lost in Spain by 1550 and no longer appear after 1600, though the letters were preserved by a conservative spelling convention until well along in the 18th century. The new phonetic distributions are as follows:

15th Century	*Modern Spain*	*America*
s and ss [s, s]	[s]	[s]
ç and z [t̪ˢ, d̪ˢ]	[θ]	[s]
x and j [š, ž]	[x]	[x]

Now, our Classic Inca documents all date from the period after the 15th century distinctions had broken down, but quite possibly before the modern groupings were stabilized. The fact that the stages of the Spanish breakdown have not been studied makes it very difficult for us to deduce the Inca sounds from the Spanish letters.

Examining the distribution of the letters s, ss, ç and z in our documents we find that they fall easily into pairs. s is used in both syllable initial and syllable final position and between vowels in free variation with ss. ç (c before e and i) is used only in syllable initial position while z is used only in syllable final position. It seems likely, then, that these four letters represent a maximum of two phonemes; the question is whether there really were two such phonemes in the Classic dialect or whether the four letters represent merely an extension of obsolete Spanish spelling conventions to Inca. In the latter case we might have only one s phoneme as in modern Cuzco and Ayacucho.

The four writers we have taken as standard for Classic Inca agree fairly well with themselves and with each other in their use of the four letters under consideration. But there are some notable discrepancies; for example, by comparing the ç section of González Holguín's vocabulary with the s section I found seven cases in which the same word appears with both letters (çaynata, ceccec, ciclla, çuchuni, çucyuni and çupullu). These discrepancies may indicate that the whole spelling system is arbitrary, but it is also possible that they represent the beginnings of a confusion between two formerly distinct sounds which were later to fall together.

I have hunted in vain for a minimal pair that would contrast ç and s; the only apparent one is çacça *full*: çacsa *ragged* in González Holguín, but these words are saksa and saqsa respectively in the modern Cuzco dialect so the contrast is illusive. Evidently if two ancient phonemes fell together in modern s little confusion was produced thereby.

However, a very convincing piece of evidence in favor of the existence of two ancient s phonemes appears in the dialect of Quito (Ecuador). No linguistic study of the Quito dialect has been made to my knowledge, but a fairly extensive missionary literature has been published in it and its documents go back to the first quarter of the 18th century. Like Cuzco and Ayacucho, the Quito dialect is derived from Classic Inca, but it has been considerably modified. Still, Quito is closer to Classic than any other dialect intervening between it and Ayacucho: the northern Peruvian dialects are notoriously deviant. My comparative material for Quito is taken from the vocabulary published by Juan Grimm; his phonetic renderings seem to be of about the same quality as those of González Holguín, which is not saying much.[22]

Grimm distinguishes systematically between two s sounds which he writes s and sh. A careful comparison of the words in his list and the spellings of González Holguín shows that there is a very high correlation between Grimm's sh and González' s, ss (only three discrepancies: çua, çocco, mizqui. I have left out of consideration half a dozen cases where Grimm's sh corresponds to Classic ch) and between Grimm's s and González' ç, z (nine discrepancies in which both have s: añas, astani, chhasca, chuspi, chuspa, huasca, llusppini, llusttini and ñusta.

[22] Juan M. Grimm, La lengua quichua (dialecto de la República del Ecuador), B. Herder, Friburgo de Brisgovia (1896).

It will be noted that in all these cases the s is in syllable final position, but plenty of other cases have the syllable final z). The existence of two s sounds in Quito whose distribution corresponds so closely to that of ç and s in González Holguín establishes a strong probability that there were also two s phonemes in Classic Inca. I propose to distingush them and write z for González' ç, z and s for his s, ss.

Just how the two sounds were pronounced is another problem. Santo Tomás, who also distinguishes z and s sounds, occasionally confuses s with x ([š] in 1560) and, as the modern Inca s is high enough to be confused sometimes with [š], I am inclined to think that Classic s was like modern s. z must have been another fricative, and probably a voiceless one, for a voiced fricative or an affricate with its distribution would be an anomaly in the phonetic system. At any rate it was not [š], for both Garcilaso and González Holguín state positively that there was no x [š] in the language. The whole problem of Inca s deserves a lot more study.

Garcilaso and González Holguín both say that Classic Inca had no l, only ll (same reference as for r). They write ll both in syllable initial ([λ_y] in the modern dialects) and syllable final position ([λ] in the modern dialects) and the two allophones probably occurred in the same positions in Classic Inca. The words that have l in the modern dialects all have ll (lluychu) or r (ccarayhua) in González Holguín. Examples of syllable final ll in Classic Inca are as follows, the first form being that of González, the second a reconstruction: sullull, sullull *true*; sullcca, sullk'a *littlest*; allcco, 'allqo *dog*; callchay, kallchay *harvest*; allpa, 'allpa *earth*; pallta, p'allta *flattened*; kallma, k'allma *branch*; challhua, challwa *fish*.

González Holguín spells a few words with l: hualan paui *a feather crest*; malta *llama lamb*; ccala purca *stew cooked by stone boiling*; calan calan *imp*. The third of these terms contains an Aymara element (ccala *stone*) and it is likely that the others are also unassimilated Aymara borrowings. Classic Aymara made frequent use of l.

There is an interesting association between r and the laterals in Inca. I have not been able to find any word in Classic Inca which contains both r and ll. Even in the 16th century there were some Inca dialects which used l where Classic Inca uses r, and a number of place names have come into Spanish with l: Lima (beside Rimac); Lunaguana, etc. (see Santo Tomás, 1891, reprint, f. 1 verso).

The four nasal sounds seem to have had the same distribution in Classic Inca that they have in Ayacucho: m occurs both syllable initial and syllable final, ñ only syllable initial and n both in syllable initial and syllable final position in the spelling of the documents. The only problem is whether the [ŋ] allophone existed and where it was used. It certainly existed, for there are a number of cases in the documents where a superfluous c is written after the n: as [ŋ] occurs in Spanish only before palatal stops and fricatives the c is evidently to show the Spanish speaking reader that the preceding n is [ŋ] and not [n]. The superfluous c appears final (many examples in Santo Tomás) and before r (rincri - González Holguín, Gramatica, f. 2 verso; in the Vocabvlario generally rinri). In addition, n before k and q is almost certainly [ŋ]. Before ll, m, s, w and y there is no way of checking the pronunciation, but as both Cuzco and Ayacucho have [ŋ] in all these cases it is logical to assume it also for Classic Inca.

Although words in Ayacucho seem to have the same nasals as in Classic, there are a number of cases of nasal shift in modern Cuzco. ñ is sometimes replaced by n in syllable initial position and syllable final m is replaced by n in all cases. Examples show Classic form, Cuzco form, translation: ñiy, niy *say*; -ñi-, -ni- (a suffix); qam, qan *thou*; kimza, kinsa *three*.

González Holguín devotes a section to the accentuation of Classic Inca in his Gramatica (ff. 95–96). He says that the accent is

always on the next to the last syllable, with two exceptions. In words having the suffixes -nkichik *ye* and -ykichik *your* the accent may be either on the next to the last or the third from the last syllable, and in stereotyped exclamations it is regularly on the last syllable. Neither in this section nor in the vocabulary does he mention final accent for arí *yes* and the four terminal suffixes which have it in both modern dialects. It is possible that the final accent in these cases is a later development; the question can probably be settled by detailed grammatical comparisons.

Santo Tomás, who describes a contemporary but not identical dialect, gives some very elaborate accent rules, the general principle of which seems to be that a word is accented on the penultimate syllable of its base, no matter how many suffixes follow. It is evident, then, that there were dialect differences in accent in the 16th century.

5. Conclusion. The purpose of the present investigation has been to determine the sound patterns of the two largest modern dialects of Inca and use the resulting comparisons to interpret a body of documentary material representing the Classic dialect. The results permit a detailed reconstruction of Classic Inca sounds and open up a whole new field of historical linguistic research such as we have for very few native American languages.

The rules for reconstructing any given Classic Inca word are given as a part of the discussion of each individual sound. A comparison of the written Classic form and the modern Cuzco form (given in various dictionaries such as those of Farfán and the Franciscanos[24]) is sufficient, or the form can be reconstructed by a comparison of the forms in the two modern dialects with a reference to Quito for the s sounds.

The comparisons made permit some interesting observations on the relationships of the dialects studied. In the first place, the modern Cuzco dialect has undergone more phonetic changes than that of Ayacucho, although Ayacucho has also changed, losing its series of glottalized and aspirated sounds. Evidently the popular belief that the Cuzco dialect is the most archaic in every respect will have to be revised. Secondary, the preservation in the Quito dialect of a sound distinction (s, z) lost in the Cuzco and Ayacucho dialects suggests that better knowledge of some of the more distant dialects may contribute much to the study of Classic Inca. And finally, the fact that Santo Tomás preserves some 16th century dialect differences offers hope of pushing back the history of the Inca language even beyond the stage recorded in the Classic documents.

[24] J. M. B. Farfán, La clave del lenguaje quechua del Cuzco, Revista del Museo Nacional, Lima, 10.215–239; 11.117–134, 249–266 (1941–42); Jorge A. Lira, Diccionario kkechuwa-español, Universidad Nacional de Tucumán, Instituto de Historia, Lingüística y Folklore, Publicación especial no. 12, Tucumán (1944); Franciscanos, Vocabulario poliglota incaico. Comprende más de 12,000 voces castellanas y 100,000 de keshua del Cuzco, Ayacucho, Junín, Ancash y Aymara. Compuesto por algunos religiosos franciscanos misioneros de los Colegios de Propaganda Fide del Perú, Lima (1905).

REVIEWS

THE STORY OF LANGUAGE. By Mario Pei. New York, J. B. Lippincott Co., 1949. 493 pages. $5.00.

Mario Pei, Associate Professor of Romance Languages at Columbia University, has attempted in this volume the difficult task of writing an account of the study of language which is understandable to the layman and still an accurate description of the discipline. He divides his work into six parts, from five to eleven chapters in length, entitled respectively The History of Language, The Constituent Elements of Language, The Social Functions of Language, The Modern Spoken Tongues, Problems of Language Learning, and An International Language.

Of these, the first two are of most concern to linguistics; the rest deal with semantics and etymology, the distribution of languages, and the applications of linguistics to the problems of language teaching and the creation or selection of an international idiom. Curiously, though Pei has, like everyone else, taken much material from other scholars, he only very rarely indicates his sources by name and he has no general acknowledgment of his indebtedness, no footnotes, and no bibliography.

On the whole the book is well written, accurately presented, and offers much that is both useful and interesting to the student of languages. However, in the sections dealing with the science of language, there are many statements which, if not entirely in error, are at least ambiguous. Thus, in discussing the age of language, Pei says:

"But there is little or no assurance that organized sound-language, as distinguished from mere animal cries, antedates pictographs painted on the walls of caves or petroglyphs carved on rocks, whose purpose was undoubtedly to convey a significant message or establish a permanent record" (p. 10).

This and other statements of a like nature suggest that Pei regards spoken language as later in time than much of culture, a proposition which is certainly not in accord with what we know of the functional role of language in culture. Many modern linguists will also query Pei's conclusion that the languages of literate peoples change less rapidly than those of non-literates (p. 86), that a "fundamental cause of sound change" is to be found in the "basic imperfections of the hearing apparatus" (p. 102), that the unit of speech, the sentence, "corresponds roughly to the unit of thought" (p. 131), and that "in the case of each semantic shift, as in the case of each sound-shift, or change in grammatical pattern, there is usually an innovation made by an individual, deliberately or accidentally, and accepted by the group" (p. 147).

Statements of this order—and those quoted are by no means exhaustive—give the book an air of easy and premature generalization quite inappropriate in a popular introduction to a difficult and highly controversial discipline. While a popular work is not expected to go deeply into complex and unsettled problems, it should avoid giving the impression that these problems are solved and it should avoid perpetuating ancient and erroneous conclusions.

As an anthropologist, this reviewer was much attracted by the title of Pei's Part III, The Social Function of Language, which, from the headings of its constituent chapters, appears to relate language to religion, the family, economics, politics, and other aspects of culture. This objective is not even attempted, however, for all that we find are accounts of vocabularies reflecting current and changing aspects of human cultures, and vocabularies, as Sapir once said, are not to be confused with the languages to which they belong. The mis-titling of these chapters no doubt springs from Pei's own definition of language as "essentially an array of words,

each of which is accepted by the social group as conveying a given meaning or meanings" (p. 111). Operating with such a definition, the whole problem of the function of language in culture, as developed for example by the late Benjamin Whorf, can scarcely be attacked.

In conclusion, then, though Pei's book has many points of interest, it will probably be more misleading than useful to the beginner in linguistics, and it may not, as the dust jacket claims, convey to the layman "the basic information about language without which he may hardly be called educated." We still need a sound, authoritative, and truly complete popular work on the science of language—one that will do for the layman and beginning student what Bloomfield's *Language* has done for the discipline itself.

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REVISTA DO MUSEU PAULISTA. Nova série, volume 2, São Paulo, 1948. 331 p.

This volume contains nine articles in Portuguese on various aspects of Brazilian anthropology and one in Spanish on the state of anthropology in Mexico (by Juan Comas). There are also reviews, news items, and a list of publications received in 1947. The volume is well printed on much better paper than volume 1 and the articles maintain a high standard of quality.[1] Only the articles of linguistic interest will be reviewed here.

Darcy Ribeiro, Sistema familial Kadiuéu, pp. 175–192. This is a competent ethnological study of the family system of the Caduveo (a Guaycurú band settled in Mato Grosso). A list of kinship terms in Caduveo is given (pp. 182–3, 186–7) in a Portuguese orthography modified only by the addition of h, "pronounced as in English," and a dash for the glottal stop. This type of transcription is of almost no linguistic value, but it is probably better for an ethnologist without linguistic training to give his minimum of native text in the orthography of his own language than for him to try to write it in half-understood phonetic symbols for which the reader may have different referents.

Arion Dall'Igna Rodrigues, Notas sôbre o sistema de parentesco dos índios Kiriri, pp. 193–205. Cariri is an independent language family of eastern Brazil made up, according to the author, of four languages: Kipea, Dzubukua, Camurú and Sapuya (p. 195; see also Lowie in BAE-B 143, 1.557–558). All four of these languages are either extinct or on the point of becoming so and are known only from 17th and 18th century grammars and catechistic works. Curiously enough, such material on the languages is fairly abundant while the culture of the Cariri speaking Indians is virtually unknown. Rodrigues points out that a considerable amount of important ethnographic information is contained in P. Luis V. Mamiani's grammar and catechism for Kipea which were published in Lisbon in 1699 and 1698 respectively, and he cites from Mamiani a considerable vocabulary and two texts with interlinear translations, all in the original orthography. The bulk of the study consists of an ethnological analysis of the kinship data contained in this material.

Curt Nimuendajú and R. F. Mansur Guérios, Cartas etno-lingüísticas, pp. 207–241. Under this title Sr. Guérios, who is Assistant in Linguistics in the Museu Paranaense in Curitiba, presents six letters on ethnological and linguistic subjects which he wrote to Curt Nimuendajú in 1943–45 and Nimuendajú's replies. This correspondence is interesting both for the light it throws on the interests and theoretical views of the two writers and because it is a mine of information on the native language of Brazil.

Nimuendajú was primarily interested in Brazilian Indians and their languages and was concerned with general theory only in so far as it furnished him with a useful and necessary tool. He combined a fine critical faculty with an acquaintance with Indians and ethnological literature that none of his

[1] Vol. 1 of this series was reviewed by G. L. Trager in IJAL 15.246–248 (1949).

contemporaries could match and the reader of these letters will acquire a great respect for Nimuendajú as a linguist. When a sound classification of Brazilian Indian languages is made it will have to be done primarily on the basis of Nimuendajú's work.[2]

Guérios has a much stronger interest in theoretical matters than Nimuendajú and is strongly influenced by Trombetti. He has also worked with Indian informants, however. The two correspondents discuss the value of certain vocabularies, informants available for some of the less well known Brazilian languages, sound correspondences and sound changes in South American Indian languages, and problems of language classification. With all due respect to Guérios, who displayed great courage and intellectual honesty in publishing this correspondence, the reviewer is inclined to agree with Nimuendajú about most of the matters under discussion.

The Brazilian Indian languages which figure most prominently in this correspondence are Caingang, Camacan and Otí. A hitherto unpublished Caingang vocabulary collected by Nimuendajú in 1909 is reproduced on pp. 221–224 with some substitution of symbols (see also Nimuendajú's comments on it, pp. 214, 228). On p. 212 Nimuendajú lists the original material he has collected on Tupí-Guaraní languages: published material on 15 languages; unpublished material on 6 of the same languages and on two more (Cocama and Guajajara, including a Cocama grammar).

The file of correspondence closes with a letter from A. D. Rodrigues to Nimuendajú and the latter's reply written only three days before his death. Rodrigues inquires what became of the rest of the group of Nimuendajú's vocabularies which Métraux started to publish in the last number of the Revista del Instituto de Etnología of Tucumán in 1932 and Nimuendajú replies that unfortunately he does not know. It happens that I can answer this question: the missing vocabularies are in my office waiting for some attention. Métraux gave them to R. H. Lowie who entrusted them to me last year. There are 20 in all, 8 of Eastern Tucano languages, 3 of Macú, 3 of Carib languages (Macushí, Wapishana, Maquiritare) 2 of Tupí languages (Tupí of the Machado and Itogapuk) and one each of Shiriana, Puinave, Ipuriná and Capishaná.

[2] The reader's attention is called especially to Nimuendajú's criticism of Rivet's classificatory methods (pp. 233–234).

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AUTO REPRESENTADO NA FESTA DE SÃO LOURENÇO, by José de Anchieta. Peça trilingüe do séc. XVI, transcrita, comentada e traduzida, na parte Tupi, por M. de L. de Paula Martins. São Paulo, Museo Paulista 1948. Boletim 1, Documentação Lingüística 1. viii + 143 pp. Paper.

With this work the Department of Linguistic Documentation of the Museu Paulista initiates a new series of publications. This first number is attractively printed on good paper with wide margins and furnished with 12 plates and rice paper interleaving.

P. José de Anchieta S. J., who wrote a famous Tupí grammar, was also a prolific writer of autos (religious dramas). He flourished in Brazil in the second half of the 16th century. Much of his work remains unpublished in the Jesuit archives in Rome. Paula Martins has prepared a critical edition of two texts of an auto of his in honor of St. Laurence which was performed in 1583–84. The play is in verse, mostly in the Tupí language but interspersed with passages in Portuguese and Spanish. The first text consists of 1489 lines and the second, which is a summary of the first, contains 492 lines. The editor prints the original text on the left page and her reconstruction on the right; a Portuguese translation of the Tupí appears on the interleaved sheets of rice paper. There are 14 pp. of notes and bibliography at the end.

The transcription used for Tupí is the one

used in the Tupí-Guaraní course in the University of Sao Paulo; the reviewer, unfortunately, knows no Tupí so is not competent to judge of its linguistic value. If the transcription is adequate this long text should prove equally valuable for linguistic analysis and for the history of Tupí literature.

The introductory material is good but somewhat fragmentary. The reader would find a brief sketch of P. Anchieta's career helpful and some information as to the history of the manuscripts should also be given.

In future publications of this nature some money could be saved by rearranging the text to do away with the rice paper interleaving. There is room for two columns of text on a page in the format used and the original and reconstructed texts might be printed side by side on the left page, leaving room for the translation and perhaps a column of notes on the right page. Comparison would be somewhat easier than with the present arrangement in which the rice paper leaves must be turned back and forth. Also, it would be better to print fewer photographs of the manuscript and reproduce them on a larger scale; the 49 pages reproduced in figs. 7 and 8 are so small as to be quite illegible.

These suggestions apart, however, this publication is a credit to its editor's scholarship and to the research program of the Museu Paulista. Long texts like this one are documents of the first importance, yet few scholars nowadays have the patience, and few institutions the vision, to publish the critical editions that make them useful to linguists.

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A DECADE OF AMERICAN INDIAN LINGUISTICS STUDIES. By C. F. Voegelin. Proceedings of the American Philosophical Society 93.137–40 (1949).

SOME SOURCES OF SOUTHERNISMS. By M. M. Mathews. Pp XII + 154. University of Alabama Press: University, Alabama, 1948. $2.50.

ETHNOLINGUISTICS AND THE STUDY OF CULTURE. By Ismael Silva-Fuenzalida. AA 51.446–56 (1949).

GRAPHIC MECHANISMS OF COMMUNICATION IN NATIVE NORTH AMERICA. By Kenneth Croft. Indiana Magazine of History 45.339–52 (1949).

SOME CHEYENNE FORMS. By William B. S. Smith. SIL 7.77–85 (1949).

TONKAWA SYNTACTIC SUFFIXES AND ANAPHORIC PARTICLES. By Harry Hoijer. SJA 5.37–55 (1949).

THE CHARACTER OF THE NAVAHO VERB STEM. By Gladys A. Reichard. Word 5.55–76 (1949).

HOW THE HURON-WYANDOT LANGUAGE WAS SAVED FROM OBLIVION. By Marius Barbeau. American Philosophical Society Proceedings 93.226–32 (1949).

DISTRIBUTION OF THE CHEMAKUM LANGUAGE. By June M. Collins. *In* Indians of the Urban Northwest. Edited by Marian W. Smith. New York: Columbia University Press, 1949. Pp. 147–60.

THE LINGUISTIC APPROACH TO SALISH PREHISTORY. By Morris Swadesh. *Ibid.*, pp. 161–73.

TRIBES AND LANGUAGES OF BAJA CALIFORNIA. By William C. Massey. SJA 5.272–307 (1949).

ESQUISSE DU SYSTÈME PHONOLOGIQUE DU NAMBIKWARA-TARUNDE. By Paul L. Garvin. Journal de la Société des Américanistes n.s. 37.133–89 (1948).

Voegelin reports on achievements during

the past decade in American Indian linguistics, and sketches current research activities. He relates progress particularly in five spheres: work in Latin America; advances in comparative linguistics, both genetic and areal; increase in publication outlets; solidification in professional organization; and improvement in mechanical recordings.

One of the most experienced lexicographers of American English, Mathews treats here three sets of vocabulary items which entered American English in the south. Each set formed originally the subject of a lecture at Alabama College. The three lectures, expanded for this presentation in book form, were devoted to two American Indian sources—Nahuatl and Muskhogean—and to Africanisms in the plantation vocabulary. In his examination of the Nahuatl contribution, Mathews mentions the following 65 direct borrowings: amole, anacahuite, anaqua, atole, avocado, ayacahuite, bisnaga, cacomistle, cacomite, camote, canatillo, capules, capulin, chacate, chachalaca, chapote, chicalote, chicle, chilacayote, chilaquiles, chile colorado, chile con carne, chilicothe, chilli, chiltepin, claco, comal, coyote, esquite, gachupin, (hot) tamale, huajillo, huisache, jacal, jicama, knockaway, McCarty, mecate, mescal, mesquite, metate, Nahuatl, nixtimal, ocelot, ocote, ocotillo, peyote, peyotillo, pinole, sacate, sacaton, sapota, shack, sin-sontle, sotol, teocalli, teocote, tepejilote, tequesite, tequila, toloache, Tulare, tularemia, tule, zopilote. About a third of the preceding are merely listed, but the rest are considered in entertaining detail. Additional Nahuatl terms have passed into English through Spanish, French, and Portuguese, in the sixteenth century, especially place names. The Muskhogean words recounted in the second lecture are these 52: Alabama, Apalachi, Apalachicola, Autauga, Bashi, bayou, Bayou Labatre, Boguechito or Bogue Chitto, Bougefalala, Boguelisa, Cahaba, cassina, cassine, Catahoula, catalpa, catawba, Chacahoula, Chattahoochee, Chickasaw, Choctaw, chumpa, Conecuh, coontie, Coosa, cooter, Escambia, Mobile, Muskogee, Notasulga, Opelika, Osceola, Pascagoula, Pensacola, Pushmataha, sacalait, Salitpa, Satilpa, Seminole, Sylacauga, Talladega, Tallahata, Tallapoosa, Tattillaba, Tennessee, Tensaw, Tickfaw, titi, Tombigbee, Tuscaloosa, Tuscumbia, Ulcanush, wahoo. In general, this is a popular work in a good sense; we note only that the term "race" is used a trifle loosely (p. 12), and that the sources were not selected with undue discrimination.

The article by Silva-Fuenzalida summarizes some recent thinking in a field that has come to be known as "ethnolinguistics." Some ethnolinguistic situations from Chile are presented as original illustrations.

According to Croft's survey, pictography was the most widespread graphic mechanism of communication in native America; petroglyphs are especially abundant. He discusses the following types into which the thousands of known pictographs fall: mnemonics, records, notices, missives, and uninterpreted forms. He also outlines the information available on Aztec and Maya graphic systems, which are the only ones bearing certain relationships to the sounds of their respective languages.

Smith's account contains an admittedly tentative phonemicization of Cheyenne, notable for the (possibly phonemic?) voiced-voiceless contrast distinguishing each vowel and semi-vowel from its pair; the same contrast distinguishes both nasals from their pairs, but affects none of the stops or fricatives. It may be worth while to investigate the patterning of [h] in relation to the voiceless vowels here, along the lines suggested by Pike for instance.[1] The forms cited fall into four groups: a set of noun-like forms, with gender indicated; the first ten numerals; "a set of several classes with unmistakable (but

[1] Phonetics 71 f. (Ann Arbor, 1943).

not yet explained) morphological markers"; and a series of kinship terms.

Tonkawa is known from Hoijer's grammar and more recent sketch; his article is by way of an addendum, intended to clarify the functions of certain syntactic suffixes. This language has two major types of syntactic construction: the simple type can have no more than one verb; the complex type must have more than one. All but the principal verb in the complex construction has some sort of syntactic suffix, a full list of which is given. Anaphoric particles frequently begin syntactic constructions, serving as links between them. Hoijer thinks this device might result from the fact that the texts are transmitted orally, and points out that similar devices "may be found in most, if not all, the languages of preliterate peoples."

Reichard's is essentially a semantic analysis: verb stems are classified according to their idea content into static verbs and verbs of action or motion (including also perceptions). The author also briefly illustrates the semantic effects of phonetic symbolism. She points to certain similarities and contrasts with other Apache tribes, Wiyot, and Coeur d'Alène.

Barbeau surveys early sources relating to Iroquoian languages and expresses his feeling that these as well as recent materials ought to be collated and published, with a view to comparative study. Such research would also solve historical problems raised by Cartier's (or Rabelais',) vocabularies of the Stadacona Iroquoians, or the migration of the Hurons and the Mohawks. His own Huron-Wyandot records still remain unpublished.

Collins reviews the literature concerning Chemakum, the genetic classification of which remains unknown, except that Andrade has demonstrated its relationship to the now presumably likewise extinct Quileute; together they constitute Chemakuan.[2] Speakers of these two languages occupied non-contiguous territories, the former on the Puget Sound coast of the Olympic Peninsula, the latter on the Pacific shore. The neighbors who surround the Chemakum are, to the west the Clallam and the Makah, to the south the Twana, to the east the Suquamish and the Lower Skagit. The author attempts to show that the geographical distribution of the Chemakum may have extended into the islands and even the mainland across on northern Puget Sound; the evidence tends to indicate that "in the nineteenth century persons familiar with Chemakum did take up residence with Lhungen-speaking peoples far to the east of their home villages on the Olympic Peninsula." Lhungen is a term used by Boas for the group of Coast Salish languages Voegelin has called Lummi-Songish-Clallam. An interesting technique employed in this paper links marriage relations among the Samish (Coast Salish) with house or village occupancy, thereby furnishing clues of complicated population movements over several generations, and may establish ties between prehistoric villages.

The contribution by Swadesh falls into three parts. The first consists of his comments regarding the comparative study of Salish languages. This group is divided into Coast Salish—(1) Bella Coola; (2) Comox, Sisiatl; (3) Squamish; (4) Nanaimo, Cowitchan, Lower Fraser; (5) Clallam, Songish, Lummi; (6) Quinault, Twana, Chehalis, Satsop, Upper Chehalis 1–2, Cowlitz; (7) Tillamook; (8) Nisqualli, Snohomish, Skagit, and Interior Salish—(9) Lilloet; (10) Shuswap; (11) Thompson; (12) Wenatchi, Columbia; (13) Okanagon, Sanpoil, Nespelim, Colville, Lake; (14) Kalispel, Spokane, Pend d'Oreilles, Flathead; (15) Coeur d'Alène. While the preceding classification is based mainly on the criterion of mutual intelligibility, hence largely vocabulary, Swadesh introduces certain further refinements by

[2] A hypothesis of Sapir's, still to be tested, suggests the combination of Chemakuan with Wakashan and Salish into a larger grouping, Mosan, and this in turn with Kutenai and Algonkian. Cf. the review of Swadesh' paper, below.

considering some phonetic factors. The second part carries us further back in time, along the lines of Sapir's Mosan hypothesis (fn. 2). As a preliminary test, Swadesh establishes "among a couple of hundred stems . . . about thirty reasonably good comparisons." The third part penetrates into the very remote past, since it ventures to meditate on the Mosan-Kutenai-Algonkian grouping. The paper is followed by twenty-six casual Salish-Wakashan comparisons from Sapir's remains. Clearly, a good deal of research must be done in these fields to make the linguistic materials serve as useful indeces of prehistoric cultures and population movements among the Salish and their neighbors; even now, though, Swadesh finds it possible to propose suggestive hints.

Since the native population of Baja California has become extinct some two centuries ago, Massey's study uses the statement of contemporary Jesuit authorities for his linguistic arrangements in this article. These groupings, which are then subdivided into rancherias or bands, are: California Yumans (Diegueño, Kamia, Paipai, Kiliwa, Ñakipa) and Peninsular Yumans or Cochimí (Borjeño, Ignacieño, Cadegomeño, Laymon, Monqui-Didiu); Guaicura (Guaicura, Calleje), Huchiti (Periúe, Aripe, Cora, Huchiti), Pericú, (Pericú, Isleño). These are discussed, documented, and mapped in fine detail.

Several factors—a certain European theory on the one hand, and certain experimental advances in the United States as well as Europe on the other—have combined after the war to focus the attention of an increasing number of linguists to the possibilities of an acoustic, supplementing or even replacing a physiological, analysis of phonemes. In 1947, Hockett asserted that operations "in terms of sound-features in the acoustic sense . . . as yet [seem] not realistically feasible,"[3] but Jakobson and Lotz have now applied just such operations to French phonemes.[4] The very nature of an acoustic analysis implies precise physical measurements: Garvin applies acoustic theory to his data, but, far from having performed the requisite experiments, he has never even heard Nambikwara-Tarunde, which has only been recorded by a then phonetically untrained ethnographer. This reductio ad absurdum of a method still in its infancy does questionable service to linguistics; it is an unhappy wedding of promising theory with sorry facts.

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[3] IJAL 13.259 (1947).

[4] Word 5.151–8 (1949); cf. Bernard Bloch, Lg. 26.93, fn. 17a (1950).